Forest Plan
Monitoring and Evaluation Report
FISCAL YEAR 2002
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Kootenai National Forest

United States Department Of Agriculture

Forest Service
Kootenai National Forest

Kootenai National Forest

FY 2002

Forest Plan Monitoring Report

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INTRODUCTION

The Kootenai Forest Plan was approved on September 14, 1987. It established management direction for a 10-15 year period that began on October 1, 1987 (Fiscal Year (FY) 1988). This direction was the result of a comprehensive analysis of land capabilities, public issues, and environmental effects along with a balancing of legal requirements.

We have now completed fifteen years of implementing the Forest Plan. Information from our monitoring reports and other assessments has been useful in preparing for revision of our Forest Plan. The Kootenai and Idaho Panhandle recently developed an Analysis of the Management Situation (March 2003), which also serves as a valuable source of monitoring and evaluation information to assist us in identifying what needs to change during Forest Plan revision.

This report evaluates the field data collected up to the end of September 30, 2002. This report is somewhat different from previous monitoring reports in that we are reporting only on information that continues to be useful in determining effects from management actions on the Kootenai. Many monitoring elements have been quite valuable in describing the effects from the management of the Kootenai. However, there have also been elements that did not achieve the level of utility most likely envisioned of them. Many of the monitoring elements are addressed in the Analysis of the Management Situation which is available on the Kootenai website at http://www.fs.fed.us/r1/kootenai/

Overall, our Monitoring and Evaluation program has found that monitoring some items worked well and some did not. We found that some of our projections in the forest plan were accomplished and some have not been.

FOREST PLAN DECISIONS

The Forest Plan is a set of decisions that guide management of the Forest. Taken broadly, it contains three types of decisions:

- **Goals, Objectives, and Desired Conditions** (pages II-1 through II-17 of the Forest Plan) provide general direction regarding where we should be headed as we put the Plan into practice.

- **Standards** (pages II-20 through II-33, Chapter III of the Forest Plan, and Forest Plan amendments) tell us how to put the Plan into practice, or give us conditions we must meet while we implement the Plan.

- **Land Allocation – Management Areas (MAs),** as described in the Forest Plan Chapter III and displayed on the Forest Plan Map, are those areas of the Forest that are allocated for different types of land management and resource production.

MONITORING

As we have found over the last fifteen years, land management occurs in complex and changing situations, and our results will not always be totally predictable, definitive, or certain. Many things, including natural events that cannot be predicted, affect management results.

The purpose of monitoring is to determine answers to the following questions: Are we doing what the Plan envisioned (implementation monitoring)? Are we seeing the effects and outputs predicted in the Plan (effectiveness monitoring)? Are the standards working (validation monitoring)? Do we need to adjust practices to meet the standards? Does the monitoring process need adjusting?

The Districts or responsible Forest Staff areas at the Supervisor's Office report monitoring data for most items annually. Monitoring forms are used to assist in collecting consistent data from the various sources. These work forms are on file in the Planning Section at the Kootenai Supervisor's Office.

Monitoring and evaluation information is being used as we work on revising our Forest Plan. A new Notice of Intent has been issued and revision of our Forest Plan is proceeding with a Draft Environmental Impact Statement and Draft Forest Plan scheduled to be available in Fall 2004.

RECREATION: Roadless Area Changes; Monitoring Item A-6

ACTION OR EFFECT TO BE MEASURED:	Determine the changes in the size and location of the roadless areas, if any.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 5% in the acreage on the Forest. +/- 5% in the distribution by Ranger District.

Purpose: This monitoring item was established because of two concerns. One concern was that any inventoried roadless area (IRA) that wasn't recommended for wilderness would probably be developed before the Forest Plan was revised (10-15 years) and would not be eligible for reconsideration as wilderness. The other concern was that the roadless areas that were designated for development would not be accessed on schedule because of delays due to appeals, litigation, etc. The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information are high.

Background: There were 32 IRAs evaluated during the preparation of the Plan. (An IRA was defined as an area containing approximately 5,000 acres or more of Federal land that does not contain any permanent signs of man's developments, such as timber harvest or roads). These 32 original IRAs covered approximately 400,000 acres. Of those acres, 334,000 (84 percent) were designated to remain roadless and were not available for development and the other 66,000 acres (16 percent) were designated to be available for possible development. (See Forest Plan FEIS Appendix C for detailed information on the IRAs.)

The Kootenai began a reinventory of roadless areas in 1994 in preparation for Forest Plan revision and completed that inventory in 1999. Those areas were used in the analysis for the Roadless Area Conservation Rule. Currently, there are 43 Inventoried Roadless Areas on the Kootenai, for a total acreage of 639,100 acres. Because of that re-inventory, some IRAs on the Kootenai have had changes in acreage and some IRAs are now included that were not part of the Forest Plan IRAs. Contiguous areas were added to some roadless areas following the definitions included in the Regional Protocol for IRA delineation. Map errors associated with the 1980's mapping were also corrected. Other changes from the Forest Plan areas are due to land exchanges since the Plan was written, or because development of some kind that was expected to occur at the time of the Forest Plan did not happen.

On January 12, 2001, the Roadless Area Conservation Rule was published in the Federal Register (FR Doc. 01-17249). This rule prohibits road construction, road re-construction, and timber harvest in IRAs on NFS Lands. The intent of this rule was to provide lasting protection for IRAs within the NFS in the context of multiple use management (Federal Register, 2001). However, the Roadless Area Conservation Rule has been contested at several levels. Until determination is made on the Roadless Area Conservation Rule, the agency policy for the protection and management of Inventoried Roadless Areas is contained in Interim Direction in Forest Service Manual (FSM) 1925.

Results: Table A-6-1 displays results of activities within roadless areas in the last fifteen years. The activities reported are those that could change the character of the roadless area to some degree. Between 1988 and 1997, approximately 5,270 acres of inventoried roadless areas had activities associated with timber harvest. No road construction within the roadless areas took place associated with those projects.

Table A-6-1 Activities within Inventoried Roadless Areas

Fiscal Year	Actual Amount of Development by Fiscal Year*	Actual Amount of Development (cumulative)
1988	1,000	1,000
1989	0	1,000
1990	2,730	3,730
1991	1,319	4,049
1992	0	4,049
1993	0	4,049
1994	46	4,095
1995	557	4,652
1996	618	5,270
1997	0	5,270
1998	0	5,270
1999	12	5,282
2000	382	5,664
2001	729	6,393
2002	0	6,393

* Acres of development are associated with timber harvest; no minerals development or road development has occurred within IRAs.

Between 1997 and 2002, there has been approximately 1,123 acres of timber harvest within inventoried roadless areas. These timber harvest activities took place in the Marston Face IRA (245 acres of harvest occurred in FY 2000 and 44 additional acres in FY 2001), Berray Mountain IRA (12 acres of harvest took place in FY 99, and 695 acres in FY 2001), Flagstaff Mountain IRA (110 acres were harvested in FY 2000). All of those roadless entries into IRAs are associated with timber harvest; no road construction within the roadless areas took place associated with those projects. No changes in IRAs have occurred because of mining.

Table A-6-2, on the following page, is a summary of management categories for Inventoried Roadless Areas along with a comparison of acres from Forest Plan FEIS Appendix C. Figure A-1 is a map comparing the boundaries of Roadless Areas Inventoried for Forest Plan Revision and the 1987 Forest Plan Roadless Areas.

Recommended Actions:

The 1987 Forest Plans provided direction to build roads and harvest timber in certain IRAs. That has proven to be very controversial, and the amount of timber harvest and road construction that was projected in the Forest Plans has not occurred. Controversy continues to accompany most proposals to harvest timber, build roads, or otherwise develop IRAs. Comments heard during the first round of Forest Plan Revision open houses in June of 2002 confirmed that IRAs continue to be a topic of great interest. The Kootenai will continue to follow the planning direction for the protection and management of IRAs. Currently, the agency policy for the protection and management of Inventoried Roadless Areas is contained in Interim Direction at Forest Service Manual (FSM) 1925.

Table A-6-2 Summary of Management Categories for Inventoried Roadless Areas 7/1/2002

(Some small private land inholdings are included in acre totals for IRAs in addition to the private acres shown)

IRA Name	total acres	Forest Plan Acres	Wilderness & Scenic Areas+	Proposed Wilderness*	Semi-Primitive/ Primitive**	Suitable, Roads OK ^^	Unsuitable, Roads OK^	Sum
Alexander #696	6,700	0			1,900	800	4,000	6,700
Allen Peak #185	29,600	0			22,700	2,600	4,300	29,600
Barren Cr #183	14,600	0			9,600	3,100	1,900	14,600
Berray Mtn #672	9,100	8,300				1,600	7,500	9,100
Big Creek #701	7,500	0			1,800	1,800	3,900	7,500
Buckhorn Ridge #661	28,800	22,000			19,300	8,300	1,200	28,800
Cabinet Face East #671	51,000	50,400		18,600	24,700	4,300	3,400	51,000
Cabinet Face West #670	13,700	10,900		8,000	2,300	1,500	1,900	13,700
Cataract Creek #665	25,400	17,700			12,000	2,600	10,800	25,400
Chippewa #682	1,300	2,300		400	100	500	300	1,300
'Cube Iron #784'	600	1,200			600			600
'Devils Gap #698'	5,400	0			900	1,700	2,800	5,400
'East Fork Elk #678'	6,800	5,000			3,500		3,300	6,800
'Flagstaff #690'	11,100	9,500			4,800	1,800	4,500	11,100
'Galena #677'	19,300	15,500			11,400	3,000	4,900	19,300
'Gold Hill #668'	6,500	10,700			1,800		4,700	6,500
'Gold Hill West # 176'	15,100	10,200			1,300	10,100	3,700	15,100
'Government Mtn #673'	10,100	8,600			6,500	1,300	2,300	10,100
'Grizzly Peak #667'	7,400	6,000			2,900	3,600	900	7,400
'Huckleberry Mtn #699'	9,000	0			4,500		4,500	9,000
'LeBeau #507'	1,300	700			400	200	700	1,300
'Lone Cliff Smeads #674'	5,100	6,600				400	4,700	5,100
'Lone Cliff West #674a'	5,300	0				700	4,600	5,300
'Maple Peak #141'	3,600	1,400			2,200	1,300	100	3,600
'Marston Face #172'	9,100	6,000			3,800	2,300	3,000	9,100
'McKay Creek #676'	15,300	13,500		6,500	2,300	3,900	2,600	15,300
'McNeeley #675'	6,700	7,700				1,700	5,000	6,700
'Mt Henry #666'	13,600	0			7,800	5,000	800	13,600
'Northwest Peaks #663'	15,300	13,400	4,600		7,900	2,700	100	15,300
'Roberts #691'	10,800	8,000			6,700	2,000	2,100	10,800
'Robinson Mtn #164'	7,000	0			4,500	2,400	100	7,000
'Rock Cr #693'	800	400			700	100		800
'Roderick #684'	29,700	24,800			10,000	6,500	13,200	29,700
'Saddle Mtn #168'	14,700	0			4,800	8,800	1,100	14,700
'Scotchman Peaks #662'	54,400	51,900		35,800	9,500	5,700	3,400	54,400
'Ten Lakes #683'	48,500	7,100	6,600	34,800	2,600	4,200	300	48,500
'Thompson Seton #483'	29,400	20,100			23,400	4,900	1,100	29,400
'Trout Creek #664'	30,900	31,400			23,500	4,400	3,000	30,900
'Tuchuck #482'	2,200	2,300			2,100	100		2,200
'West Fork Elk #692'	5,200	4,800				1,500	3,700	5,200
'West Fork Yaak #694'	8,200	0			3,900	4,100	200	8,200
'Willard Estelle #173'	33,000	18,500			25,600	3,600	3,800	33,000
'Zulu #166'	10,000	6,400				7,000	3,000	10,000
TOTAL IRA Acres	639,100	403,300	11,200	104,100	274,300	122,100	127,400	639,100

SUMMARY

Total IRAs	639,100
Cabinet Mountains Wilderness	93,700
Total Unroaded Category Lands (IRAs plus Wilderness)	732,800
Other FS Lands not within IRAS	1,517,000
TOTAL FS Lands	2,249,900
Private land not in IRAs	763,000

note: the Roadless Area Conservation Draft EIS (May 2000) listed total acres as 628,000 because the acres for Northwest Peaks and Ten Lakes Scenic Areas were left out of the total acres. They have been included with their surrounding IRAs in the Kootenai totals. Some areas of proposed wilderness (MA 8) were coded incorrectly in the Roadless EIS in Chippewa and McKay Creek IRAs; these are now coded correctly.

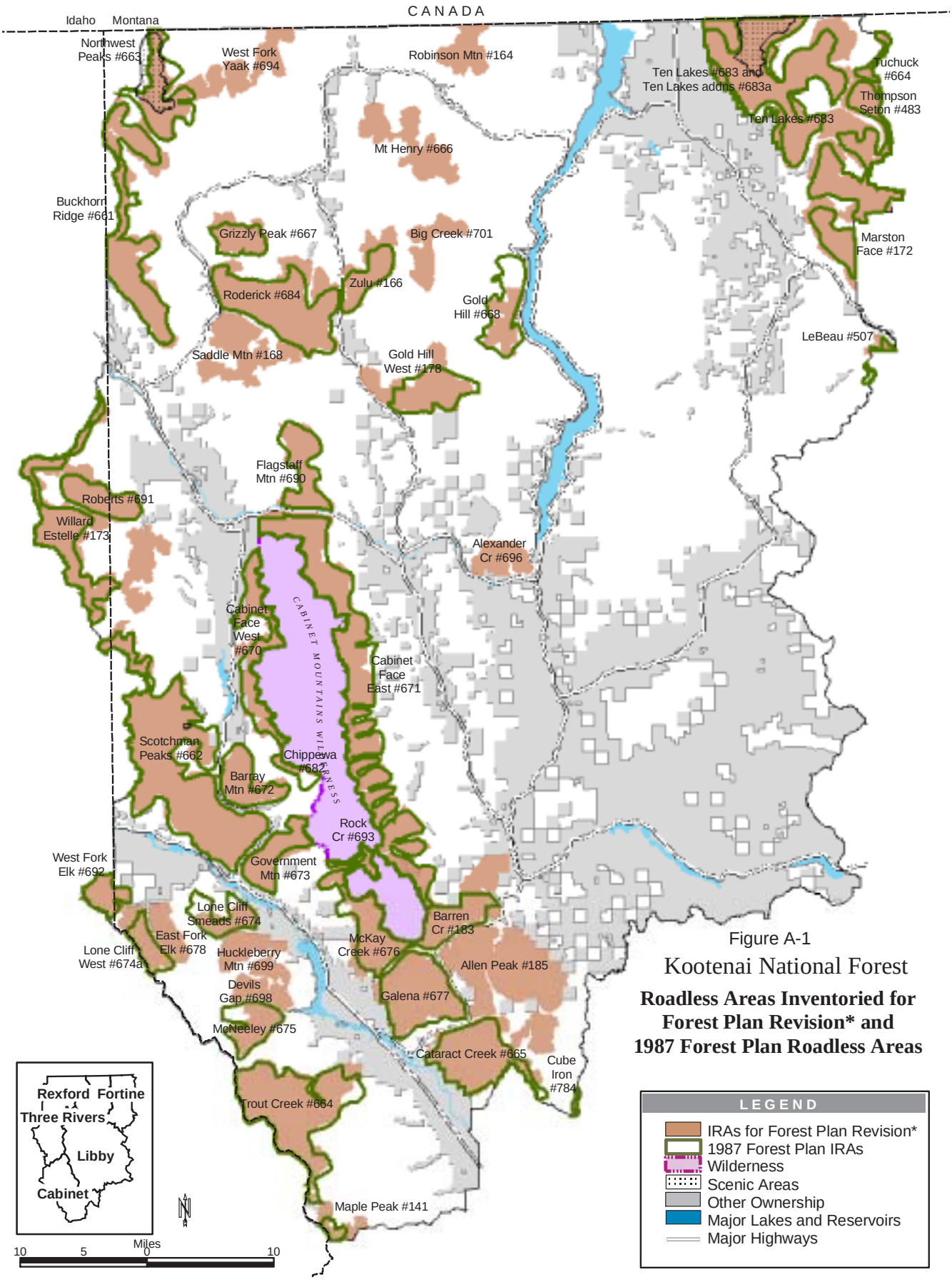


Figure A-1

Kootenai National Forest

Roadless Areas Inventoried for Forest Plan Revision* and 1987 Forest Plan Roadless Areas

WILDLIFE & FISHERIES: Elk Habitat; Monitoring Item C-1

ACTION OR EFFECT TO BE MEASURED:	Changes in elk habitat capability.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Any downward trend in elk summer range habitat effectiveness.

Purpose: This monitoring item was established to help ensure that elk summer range habitat capability is improved to provide for an increase in the elk population from 5,000 in 1988 to 8,000 in 2017. The Forest Plan requires that this item be reported once every five years. The expected precision and reliability of the information are moderate.

Background: Potential changes to habitat are analyzed when projects are proposed. This analysis uses the habitat effectiveness determination process outlined in the *Elk Habitat and Timber Management Relations, Central Zone*. The process evaluates such factors as open road density, the amount of hiding cover, and the amount of forage. These factors are compared against the existing condition to determine whether the habitat is improving, maintaining, or declining in overall capability. There are about 1,393,000 acres of elk biological summer range on the Forest. Of this, 466,215 acres are allocated for big game summer range (Management Area 12). The other MAs that make up the biological summer range include: 2, 3, 5, 7, 8, 9, 13, 18, 14, 21, and 29. While MAs 15 and 16 can provide summer range habitat, they were not included in the Plan elk output projections due to the anticipated timber harvest levels and resulting low habitat values. In addition to summarizing the overall elk habitat capability, we have evaluated elk habitat effectiveness and elk security.

Evaluation:
Elk Habitat Capability: Baseline measurements are not available for comparison prior to the Plan. The three five year periods (1988-1992, 1993-1997, and 1998-2002) of Forest Plan implementation monitoring are summarized in Table C-1-1 along with the fifteen-year totals.

During the last five years, the net change has been an improvement of 3 percent in habitat capability on the lands analyzed.

Over the past fifteen years, the net change is an improvement of 6 percent in habitat capability on the lands analyzed.

Table C-1-1 **Elk Habitat Capability Analysis**

Time Period	Area Analyzed *	Area Improving	Area Maintained	Area Declining
1988-1992	472,000	282,000	138,000	52,000
1993-1997	1,260,614	320,736	835,961	53,918
1997-2002	1,313,837	435,734	842,843	35,260
1988-2002	3,046,451	1,038,470	1,816,804	141,178

* Some duplication of acres analyzed occurred between first and second five and second and third year periods.

Elk Habitat Effectiveness: Elk habitat effectiveness directly correlates with open road density. The higher the open road density, the less effective the habitat. Road density data was not available Forest-wide for the primary elk summer range (MA 12) for the time period prior to 1997.

MA 12: The Plan specifies that 0.75 miles per square mile of road would be open to the public on MA 12 lands, which correlates to a 68 percent habitat effectiveness level. Currently the open road density (ORD) on MA 12 is an average of 0.9 miles per square mile. This is higher than the desired 0.75 miles per square mile specified in the Plan. The current ORD (0.9 mi./sq.mi.) reflects a habitat effectiveness level of 62 percent. In the last five years there were two Forest plan amendments that allowed increases in MA 12 ORDs. Over the past fifteen years, there have been seven such amendments. The amendments affected only 3 percent of the MA 12 lands.

Biological summer range (MAs 2, 3, 5, 7, 8, 9, 12 13, 18, 14, 21, and 29): The biological summer range has an ORD of 0.52 miles per square mile, which provides a 74 percent habitat effectiveness level. This is an improvement over the 1997 status (1.2 mi./sq.mi. = 58% h.e.).

Forest-wide (including MAs 15 and 16): Since there is limited historical (first 10 years) data available for just MA 12 or the biological summer range on habitat effectiveness, the information for all Forest lands (all MAs) is used to show the probable trend. The trend in habitat effectiveness shows an improving condition (shown in Table C-1-2). This same trend is likely on summer range (both MA 12 and biological). While the Forest Plan ORD level in MA 12 is not met on the Forest as a whole (ORD = 0.9 mi./sq.mi.), the trend is improving. In addition, the biological summer range is providing the overall desired habitat effectiveness level (68 percent).

Table C-1-2 **Forest-wide Elk Habitat Effectiveness Trend**

Year	Open Miles	Miles Restricted Yearlong	Total Miles	% Restricted Yearlong	ORD* (mi/sq mi)	Habitat Effectiveness %**
1987	4,530	1,670	6,200	27	1.3	56
1988	3,707	3,195	6,972	46	1.1	58
1992	3,364	3,785	7,149	53	1.0	60
1997	3,082	4,275	7,357	57	0.91	62
2002	2,934	4,982	7,954	63	0.86	63

* ORD = Open miles/3,373 square miles (Area of KNF capable of providing elk habitat- summer and winter)
** Elk Habitat Timber Management Relations Central Zone Northern Region, Figure 2 pg. 13. USDA FS, MFWP, C S & K Tribes, PC Timber Inc. 1985. 20 pp.

In 1988, when Forest-wide habitat effectiveness was 58 percent, the elk population potential index was 5,000 elk. At the end of the 10 year monitoring period (1997) habitat effectiveness had reached 62 percent, with a resulting increase (31 percent) in the elk potential population index (6,555 elk). Now at the end of the third five-year reporting period, habitat effectiveness is up to 63 percent. This increases the elk potential population index to 6,660 elk, a 33% increase since 1988. This equated to a 1.6% increase over the past 5 years. The Plan projected a population potential increase of 3,000 elk over a 30-year time frame. The increases in the elk potential population index are occurring more quickly than projected in the Forest Plan. One reason is that the level of road construction on MA 16 and others is lower than expected in the Forest Plan. These lands have been able to provide higher summer range habitat values than projected in the Plan. See monitoring item C-2 for more information on the elk population.

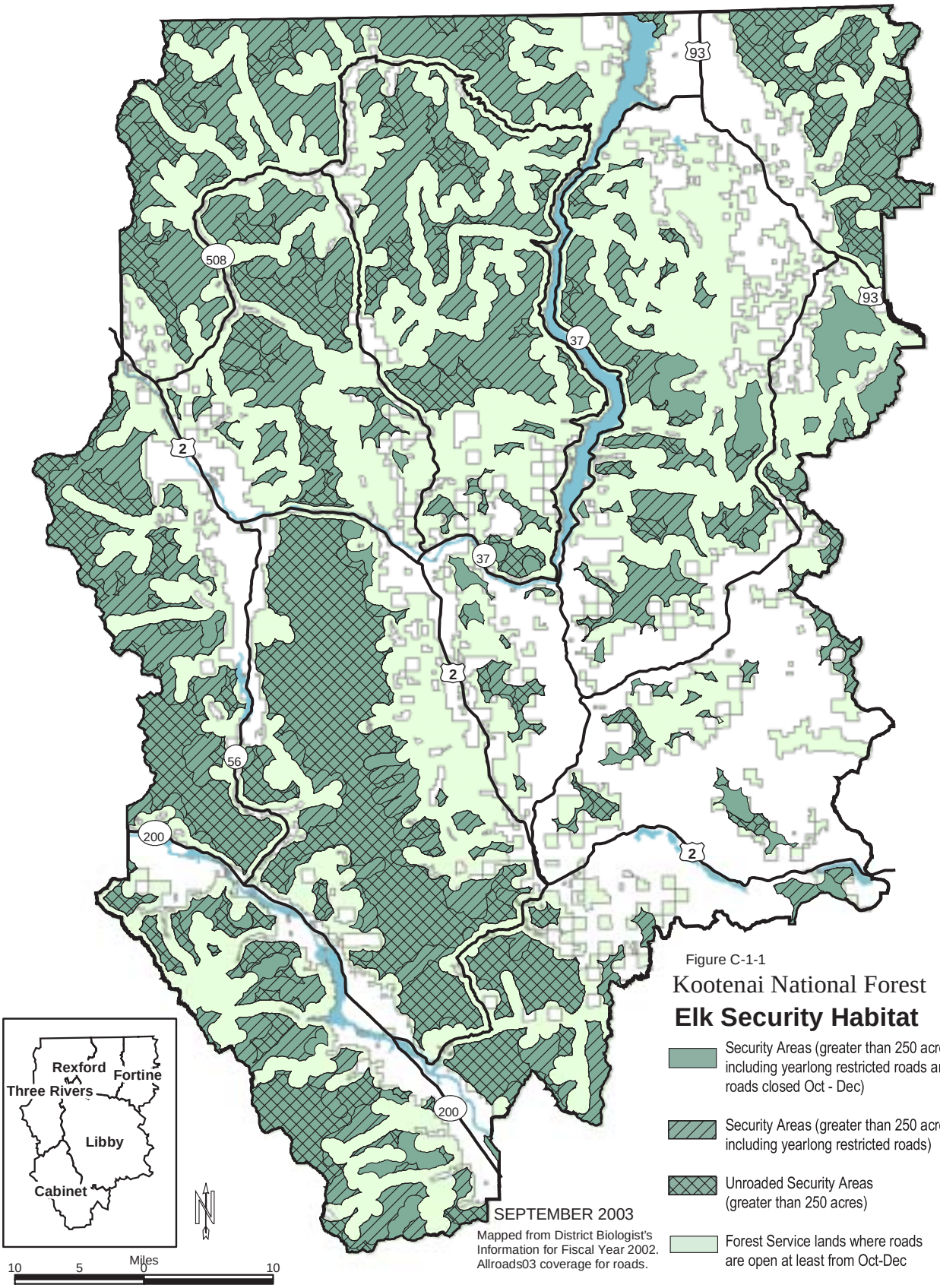
Elk Security: Elk security has been identified by Montana Fish, Wildlife and Parks as an increasing area of concern. Baseline data was established in the 1997 monitoring report. We evaluated elk security habitat at two levels (forest-wide and Forest Planning Unit). Hillis et. al. (1991) suggests that hunting season security habitat be no less than 30 percent of the analysis unit. At a Forest-wide basis this level of security is provided (see Table C-1-3). Seven of eight Planning Units provide adequate security habitat (see Table C-1-3 and Figure C-1-1). The one Planning Unit (Fisher) that does not meet the recommended 30 percent

security level includes large amounts of private land. Security on just the federal lands would be higher than the amount shown in Table C-1-3. The forest-wide security level for elk remains unchanged from the 1997 level of thirty nine percent.

Table C-1-3 **Security Habitat by Planning Unit****

Planning Unit	Planning Unit Area	Unroaded Security Area (%)		Unroaded Security + Roads Restricted Yearlong Area (%)		Unroaded Security + Roads Restricted Yearlong + Roads Seasonally Restricted Area (%) *	
Bull	295,000	70,000	24%	137,000	46%	145,000	49%
Clark	527,000	163,000	31%	261,000	50%	261,000	50%
Fisher	579,000	46,000	8%	105,000	18%	105,000	18%
Koocanusa	475,000	24,000	5%	153,000	32%	158,000	33%
Kootenai	366,000	72,000	20%	122,000	33%	133,000	36%
Stillwater	39,000	4,000	9%	18,000	47%	18,000	47%
Tobacco	331,000	38,000	11%	97,000	29%	98,000	30%
Yaak	398,000	59,000	15%	233,000	59%	236,000	59%
Forest-wide	3,010,000	476,000	16%	1,126,000	37%	1,154,000	38%

* This column equates to hunting season security habitat.
** These figures include private land. Forest lands generally provide higher levels of security than indicated by this table.


93
508
93
37
2
37
2
56
200
2
200
Rexford
Fortine
Three Rivers
Libby
Cabinet
Miles
10
5
0
10
Figure C-1-1
Kootenai National Forest
Elk Security Habitat
Security Areas (greater than 250 acres including yearlong restricted roads and roads closed Oct - Dec)
Security Areas (greater than 250 acres including yearlong restricted roads)
Unroaded Security Areas (greater than 250 acres)
Forest Service lands where roads are open at least from Oct-Dec
SEPTEMBER 2003
Mapped from District Biologist's Information for Fiscal Year 2002. Allroads03 coverage for roads.

WILDLIFE & FISHERIES: Elk Populations; Monitoring Item C-2

ACTION OR EFFECT TO BE MEASURED: Determine changes in elk populations.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Any downward trend in elk populations

Purpose: This monitoring item was established to determine if the Forest Plan's projected increase in elk populations actually occurs. The Plan did not establish a numerical population goal for elk, but rather projected an increasing trend in response to improving habitat conditions. The Plan requires that this item be reported once every five years. The expected precision and reliability of the information are moderate and low, respectively.

Background: Elk population changes are based on hunting and harvest reports (phone surveys), hunter-check station information, aerial surveys, and casual observations. The figures represent the Hunting Districts that are generally encompassed by the Kootenai National Forest (100, 101, 103, 104, and 121). Montana Fish, Wildlife and Parks (MFWP) (Sterling 2002) provided the data used in this monitoring item, and we thank them for their cooperation. Some data for 1997 and 1998 were not available due to lack of funding for MFWP to conduct surveys. Conclusions drawn from the data are the responsibility of the Kootenai National Forest. Elk populations are the product of many factors including habitat conditions, weather severity, and hunting regulations. The elk population trends observed over the last 15 years generally reflect the changes occurring from all these factors.

Evaluation: The aerial survey data on elk numbers show an increase since this item was last reported in 1997. The numbers of elk observed during surveys increased from 833 in 1997 to 1,778 in 2002, with incremental increases each of the last 5 years. The number of calves per 100 cows also shows the same upward trend, going from 18 (1997) to 31 (2002). Elk populations increased through 1990 or 1991 and then had a gradual decrease until 1997. The downward trend appears to have changed over the most recent 5-year reporting period (1998-2002). The number of spike bulls observed show an increase which is another indication of recruitment into the population.

The hunting season regulations changed between 1996 and 1998 from allowing harvest of any bull (cows by permit only) to branch antlered bulls only (cows remain by permit only). The average number of days required to harvest an elk prior to the change was fewer than 120. Over the last three years, the average number of days has increased to 190 days. This increase is likely due to the change in hunting regulations rather than any decline in elk numbers.

The percentage of 6-point or greater bulls in the bull elk harvest has steadily increased since the last report (averaged 19% for 1992-1996) to an average of 38% for the last 3 years (no data for 1997 and 1998). This may reflect an increasing age structure among bulls. This may be due to increased elk security on the Forest as a result of the road restrictions that have been implemented over the past 15 years. The changed hunting regulations, improvement in hunting technology and skill level of hunters, and an increased emphasis on trophy bull harvest, may also be contributing to the increasing proportion of mature bulls in the harvest.

Elk populations appear to be increasing in the last few years. Possible factors include habitat improvements from wildfire, prescribed burning, timber harvest, and access management; mild winter

conditions; and changes in hunting regulations. See Monitoring Item C-1, which indicates habitat conditions are improving. At this time, no change in habitat management is warranted.

Recommended Actions: Continue monitoring elk populations to determine future trends. Coordinate with MFWP on changes in hunting regulations that may be needed to produce a desired trend in the elk population and provide for a desired age structure in the bull segment. Integrate the State's Montana Elk Management Plan with the Kootenai Forest Plan Revision.

References: Sterling, Bruce. 2002. Region One Elk Annual Report July 2001 – June 2002. MFWP, Kalispell, MT. 36 p.

WILDLIFE & FISHERIES: Old Growth Dependent Species; Monitoring Item C-4

ACTION OR EFFECT TO BE MEASURED:	Population levels of old growth dependent species.
MONITORING OBJECTIVE:	Maintain viable population of old growth dependent species ($\geq$ 40% of potential).
VARIABILITY WHICH WOULD INITIATE levels FURTHER EVALUATION:	Any reduction approaching minimum viable population (40% of potential population)

Purpose: This monitoring item was established to help ensure that viable populations of species dependent on old growth habitats were maintained. The expected precision and reliability of the information are moderate and low, respectively. The Forest Plan requires that this item be reported every five years.

Background: The pileated woodpecker (*Dryocopus pileatus*) is the designated old growth habitat management indicator species on the Forest. Old growth forests and cavity habitat are key components of the species' habitat. The National Forest Management Act states that "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area....In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area." 36 CFR 219.19. Monitoring items C-5 Old Growth Habitat, and C-6 Cavity Habitat evaluate the habitat needed to support a viable population of pileated woodpeckers.

The purpose of this monitoring item is to evaluate population levels of old growth dependent species, i.e. pileated woodpecker. There are several different approaches to assessing population viability, ranging from subjective assessments to detailed quantitative models requiring substantial demographic data. The scientific community accepts each of these approaches as valid depending on the circumstances, such as the amount of data available, and the habitat associations, behavior, and demographic characteristics of the individual species being assessed. In March 1997, the Northern Region of the USFS approved a six-step strategy for assessing and managing population viability. This strategy incorporates a review of twelve potential methods or tools for assessing population viability which were identified and described through a contract with a leading academic scientist. The strategy and methods are documented in a Forest Service paper titled *Population Viability Protocol* (Samson et. al. 1997), which establishes future guidance for population viability assessment in the Northern Region.

The Forest Plan monitoring item indicated that personal observations and transects may be used as data sources to analyze population viability. As noted in the FY 92 Monitoring Report, technically reliable and cost efficient techniques for conducting population trend surveys for pileated woodpecker were not established and discussions among wildlife professionals were continuing on the subject. It goes on to state that it had not been determined if the Forest should independently survey for this species, or if efforts on the Kootenai should only contribute toward a much larger combined-forest or Regional survey effort.

Based on discussions with wildlife professionals and the Regional Office, the Kootenai became a participant in the Region 1 Landbird Monitoring Program which started in 1993.In this program, transects consisting of multiple bird monitoring points are set up within a wide range of habitats distributed

geographically across the Kootenai National Forest. All migratory and resident bird species detected by specialists trained in bird identification are recorded at each point on each transect. These points are established as permanent points. The information from these points is transmitted to Dr. Richard Hutto, internationally recognized bird expert, at the University of Montana, where it is tabulated for each participating National Forest and for the Region overall. Data have now been collected for several thousand points within the Region, including on the Kootenai Forest, and the data is statistically valid to provide information on bird species presence, distribution, and habitat associations. Over a period of years, the data will also provide information on bird species population trends.

Results: Personal observation by Forest biologists indicate that pileated woodpeckers are observed frequently on the Kootenai, and these informal observations provide no indication of any major population change for the species.

Data collected in the R-1 Landbird Monitoring Program for the Kootenai National Forest during 1994-2002 is summarized in Table C-4-1.

Table C-4-1 **Pileated Woodpecker Observations on KNF Bird Monitoring Points**

Fiscal Year	Number Points Sampled	Number & Percent Observed on Sampled Points	
1994	530	49	9.2%
1995	579	32	5.5%
1996	545	48	8.8%
1998	350	25	7.1%
2000	316	39	12.3%
2002	318	11	3.5%

In 1997, a regional decision was made to change the long term landbird monitoring sampling effort to every other year, with a different sampling approach in intermediate years used to assess various management questions. In 1997, special paired monitoring sites were selected to begin assessing the effects of intermediate timber harvest on pileated woodpeckers (J. Young, unpublished). Twelve treated and 12 control sites, each containing 3 sample points, were selected on the Kootenai. A total of 45 pileated woodpeckers were detected at these sites. Because the study design for this effort called for differences in data collection compared to the data shown for the years 1994-1996, the results are not directly comparable. However, University of Montana personnel will summarize the results of this study in a future report.

The landbird monitoring results for the Northern Region showed pileated woodpeckers present to varying degrees in all vegetation types sampled except agricultural and residential (Hutto 1995). “The species appears to do well in a matrix of forest types, but the inclusion of some older forest with large trees is probably necessary. There's generally...an intact forest near where these birds are detected (though not necessarily within 100 m). Thus, detecting them in clearcuts and seed-tree cuts should not be taken to mean they can do well with homogeneous stands of those kinds."

Based on the monitoring results it was determined that the rate of detections can vary greatly from year to year, especially for a wide ranging species like the pileated woodpecker that may or may not be anywhere near a given point on a given day. Part of this variation is due to chance and part is due to observer variability (for example, the single observer on the Kootenai in 2002 detected relatively low numbers for most other species as well). Therefore, it is unlikely that the lower numbers in 2002 represent any sort of real crash in the population. This is one reason why real trends take many years to confirm.

For the reasons stated above it was recommended that data from a single forest not be used to calculate trends. Results of the Northern Region Landbird Monitoring Program, which contains much larger sample sizes coordinated throughout the region, were reviewed. At the present time these sample sizes are not considered large enough to confidently make comparisons between the forest and regional data, especially for less common species like the pileated woodpecker. Because the pileated woodpecker is relatively uncommon and erratic, two other old growth associate species were also reviewed. Although the pileated woodpecker requires a certain amount of old growth in the landscape, it is thought that the winter wren and brown creeper are actually more strongly associated with old growth forest stands. For this reason they are included in this report.

Table C-4-2 displays data for all of USFS Region One west of the Continental divide for the 138 transects that were run every year. These numbers are better for comparison among years because they summarize the same set of surveys in each year.

Table C-4-2 **Pileated Woodpecker Observations on Region One Monitoring Points**

Fiscal Year	Number Points Sampled	Number & Percent Observed on Sampled Points	
1994	1370	72	5.3
1995	1378	105	7.6
1996	1366	98	7.2
1998	1368	89	6.5
2000	1362	141	10.4
2002	1369	92	6.7

Table C-4-3 **Winter Wren Observations on Region One Bird Monitoring Points**

Fiscal Year	Number Points Sampled	Number & Percent Observed on Sampled Points	
1994	1370	235	17.2
1995	1378	234	17.0
1996	1366	197	14.4
1998	1368	363	26.5
2000	1362	397	29.1
2002	1369	244	17.8

Table C-4-4 **Brown Creeper Observations on Region One Bird Monitoring Points**

Fiscal Year	Number Points Sampled	Number & Percent Observed on Sampled Points	
1994	1370	20	1.5
1995	1378	20	1.5
1996	1366	41	3.0
1998	1368	101	7.4
2000	1362	149	10.9
2002	1369	128	9.3

The results of the Region One monitoring are similar to those discussed for the Kootenai data. It will take many years to gather enough information to determine any accurate trends. Based on the information gathered to date it is not possible to confidently determine any trends for any of the species identified.

In 2002 the Forest did a forest wide inventory of all its lands to determine how much old growth exists (see monitoring item C-5). The Forest Plan direction is to maintain 10% of its lands below 5500 feet elevation in old growth, well distributed across the landscape (USDA Forest Service 1987, pp II-7, 22, III-54). The inventory determined that there is more than 10% old growth distributed across the forest and there is the potential to maintain more than 10% effective old growth on the forest.

Evaluation: Hutto's report, the preliminary population transects, and Forest staff observations all point to the same consistent interpretation that pileated woodpeckers are widespread and are relatively common on the Kootenai National Forest. The information available at this time does not indicate that a significant downward trend approaching 40 percent of population potential is occurring. Information for the Region is similar for the pileated woodpecker as well as the two other old growth dependent species.

Recommended Actions: it is recommended that the Forest and the Region continue participation in the R-1 Landbird Monitoring Program. It is also recommended that the Forest continue its on-the-ground validation of old growth, complete the validation in as short a timeframe as possible, and complete the designation of old growth to best meet the needs of old growth dependent species.

WILDLIFE & FISHERIES: Old Growth Habitat; Monitoring Item C-5

ACTION OR EFFECT TO BE MEASURED:	Old growth habitat amount and condition
MONITORING OBJECTIVE:	Maintain habitat capable of supporting viable populations of old growth-dependent species (10 percent old growth in each drainage).
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Reduction below 10 percent in a drainage which was previously over minimum or any reduction in a drainage previously under minimum.

Purpose: This monitoring item was established to help ensure that an adequate amount of old growth habitat is designated on the Forest. The Forest Plan requires that this item be reported every two years. The expected accuracy and reliability of the information are both moderate to high.

Background: Old growth habitat is recognized as an important and necessary element of diversity that supports a myriad of wildlife species. Maintenance of adequate old growth will assist in ensuring viable populations of native species and in maintaining diversity as required by the National Forest Management Act of 1976 (16 U.S.C. 1600) (FP, Appendix A17-14). To provide habitat for viable populations, the Plan (Volume 1, page II-22) specifies that at any time 10 percent of the Kootenai National Forest land base below 5,500 feet elevation would be managed as old growth habitat for dependent wildlife species. The old growth would be spread evenly through most major drainages, and would represent the major forest types in each drainage.

Forest Service Manual 2400, Timber Management, Kootenai Forest Supplement number 85 issued in January, 1991 provides the direction for validation of old growth on the Forest. This supplement clarifies procedures for old growth habitat validation on the Forest before a timber sale is prepared. Validation, as defined in the Manual, is “on-the-ground verification”. One of the requirements established is that old growth habitat be designated at a minimum of 10 percent for each third order drainage or compartment (or combination of 3rd order drainages or compartments). If 10 percent effective old growth does not exist within a compartment, then old growth from an adjacent compartment can be used to make up the difference, as long as there is 10 percent effective old growth when both compartments are combined. In cases where one drainage has insufficient old growth to meet the 10% requirement, and additional old growth has been designated in an adjacent drainage to make up the difference that will be noted in the environmental documents. Substituting stands in adjacent drainages will be the exception and will be used only when one drainage has insufficient old growth or an adjacent drainage can provide larger contiguous stands or significantly better quality old growth. This is shown as "Effective Old Growth" in the tables below.

If no other effective old growth is available then the best available soon-to-be future old growth is identified and designated to bring the third order drainage or compartment (or combination of) up to 10 percent. These protected, mature stands are known as old growth replacement stands because they are replacing a current deficiency of higher quality old growth habitat and will provide for old growth habitat in the future as they age and gain the desirable attributes. This is shown as "Acres of Replacement Old Growth" in the tables.

Management emphasis is to provide the best possible distribution of old growth habitat wherever possible, and high-quality old growth is to be a priority for protection (see the Forest Plan Glossary and Appendix 17 of the Plan for more detail on the description of old growth attributes, including desired distribution patterns).

The forest has been validating portions of its lands over the past fourteen years (1989 – 2002), with the exception of the year 2000 where no validation took place. During that year the forest was extremely busy with numerous fires that consumed both time and funds. Validation includes the on-the ground verification of stands to ensure that they are old growth. Kootenai Forest Service Manual 2400 describes the validation process to be conducted on a compartment basis before the Forest conducts management activities that could affect old growth habitat.

In 2002, in response to litigation alleging that the forest lacked sufficient information as to the overall amount and distribution of old growth, the Forest conducted a forestwide inventory, using various survey methods, on all of its lands. The inventory included all of those lands previously validated as old growth, as well as all other National Forest lands. This inventory was conducted, in part, to validate if the Forest did indeed have an adequate amount of old growth habitat, i.e. 10% of the National Forest lands below 5500 feet in elevation, as well as the condition (whether it was considered effective or replacement) of old growth.

Results: Table C-5-1 displays the forestwide inventory of old growth determined to occur on the Kootenai National Forest. The table also depicts whether the old growth is considered to be effective or replacement, and if the old growth has been designated or remains undesignated.

Table C-5-2 displays the result of old growth surveys for each fiscal year from FY 89 through FY02. The table displays total acres surveyed, how much of that has been designated old growth, and how much is considered effective old growth. The information for 2002 includes data from the forest wide inventory. Some of the areas include reassessments of previously completed compartments because of changed conditions and so the information in Table C-5-2 cannot be totaled as this would result in double accounting of some acres.

Table C-5-2 **Old-Growth Habitat and Condition Survey Results**

FY	Acres surveyed	Designated Old Growth Habitat		Portion of designated old growth that is fully effective old growth habitat	
89	94,210	12,730	13.5%	8,450	66%
90	176,560	18,770	10.6%	17,030	91%
91	334,300	39,410	11.8%	36,520	93%
92	212,380	20,930	9.9%	15,500	74%
93	72,253	10,393	14.4%	8,455	81%
94	49,381	5,474	11.1%	4,312	79%
95	158,736	19,416	12.2%	14,340	74%
96	215,483	24,080	11.2%	17,954	75%
97	158,495	16,948	10.7%	15,650	92%
98	372,454	42,304	11.2%	33,626	79%
99	269,920	28,587	10.6%	19,894	70%
00	0	0	0	0	0
01	41,872	4,576	10.9%	3,986	87%
02	1,869,953	205,783	11.0%	127,615	62%

Table C-5-1 **Forestwide Old Growth Below 5500' Elevation**

7/10/2003

		Designated old growth (designated as an old growth MA)*				Undesignated old growth (not in an old growth MA)*			TOTAL EFFECTIVE old growth (designated and undesignated)*		Total Replacement old growth (designated & undesignated)*	Grand Total ALL TYPES old growth*	
D	FS ACRES (total FS acres under 5500' minus lakes and highways)	designated and effective (plot, walk, vrec)	designated and effective (pi)	designated and replacement	desig unknown (original FP categorized as pi)	undesignated and effective (plot, walk, vrec)	undesignated and effective (pi)	undesignated and replacement	TOTAL acres effective old growth	Percent of FS Acres in effective old growth		Acres of all old growth	Percent of FS Acres as old growth
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
D1	245,653	21,920	0	4,070	343	16,567	172	6,812	38,796	15.8%	10,882	49,678	20.2%
D3	184,360	17,235	2,761	1,235	1,494	17,355	1,599	0	38,102	20.7%	1,235	39,337	21.3%
D4	504,520	33,569	254	15,446	1,740	5,422	5,655	1,901	43,580	8.6%	17,347	60,927	12.1%
D5	557,263	43,561	1,655	22,230	606	3,703	5,031	6,873	51,639	9.3%	29,103	80,742	14.5%
D7	378,157	4,565	2,095	14,398	16,606	2,046	10,980	22,832	24,420	6.5%	37,230	61,650	16.3%
total	1,869,953	120,850	6,765	57,379	20,789	45,093	23,437	38,418	196,538	10.5%	95,797	292,335	15.6%

*All old growth acreages and percents shown in this table include only those stands below 5500' elevation. Not shown are over 19,000 acres of old growth that has been identified above 5500' elevation.

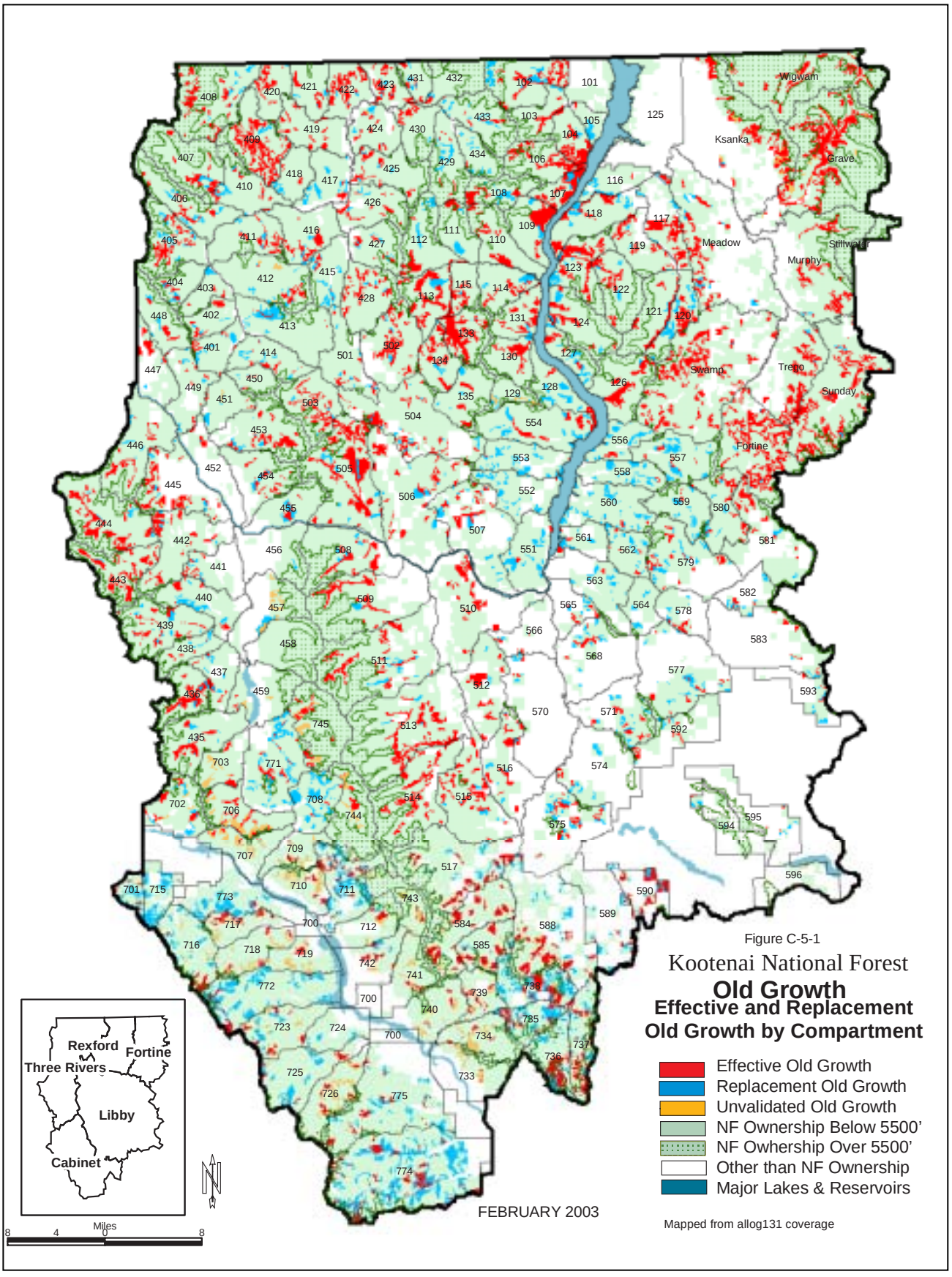
(1) Total FS Acres minus those acres over 5500' elevation, lakes and highways
(2) Designated Effective Old Growth stands - designated as a Management Area (MA) - inventoried by plot, walk-through or visual recon data
(3) Designated Effective Old Growth stands - designated as an MA - inventoried by photo interpreted data - only 60% of this acreage is calculated as effective old growth (ref FP App 17, pg.17-3)
(4) Designated Replacement Old Growth stands - designated as an MA
(5) Designated unknown: Old Growth designated in the original Forest Plan as an MA, not inventoried yet to determine effectiveness - only 60% of this acreage is calculated as effective old growth (ref FP Appendix 17-3)
(6) Undesignated Effective old growth - not in an old growth MA - inventoried by plot, walk-through or visual recon data
(7) Undesignated Effective old growth - not in an old growth MA - inventoried by photo interpreted data - only 60% of this acreage is calculated as effective old growth (ref FP App 17, pg.17-3)
(8) Undesignated Replacement stands
(9) Total acres of effective old growth includes column (2) + column (6) and 60% of column (3), (5) and (7) (these columns reflect stands inventoried by photo interpretation: Ref FP App 17, pg 17-3)
(10) Percent of Forest Service acres that are effective old growth = TOTAL old growth (column 9) divided by total FS acres (column 1)
(11) Total Replacement old growth acres = column (4) + column (8)
(12) Total all acres of old growth below 5500' = total effective old growth (column 9) + total replacement old growth (column 11)
(13) Percent of Forest Service acres that are effective or replacement old growth below 5500' = Total all acres old growth (column 12) divided by total FS acres (column 1)

Since February, 2003, several numbers in this table have been corrected as a result of site specific analysis. Additional changes will continue to occur as site specific planning and validation of areas continues.

There are approximately 1,869,953 acres (excluding lakes and highways) of National Forest lands below 5500 feet in elevation. There is a total of 292,335 acres (15.6%) of National Forest lands below 5500 feet in elevation that is in an old growth condition (either effective or replacement). Approximately 10.5% (196,538 acres) of those lands were determined to be effective old growth and an additional 5.1% has been identified as replacement old growth (see Map C-5-1). To date a total of 205,783 acres (11%) have been designated as old growth with 127,615 acres (6.8%) being designated as effective and the remainder (4.2%) designated as replacement (see Map C-5-2).

Evaluation: The monitoring and evaluation of old growth habitat continues to indicate that the forest is meeting its forest plan requirement for designating 10% old growth habitat well distributed across KNF lands below 5500 feet elevation.

Recommended Actions: Old growth validation (on-the-ground verification) and designation needs to continue as described in FSM 2400. Priority should be to 1) complete validation as soon as practical for areas that have been partially validated and then to areas that have not been validated at all, and 2) for those compartments that have been validated (existing and future) designation of old growth also needs to occur as soon as practical.


Wigwam
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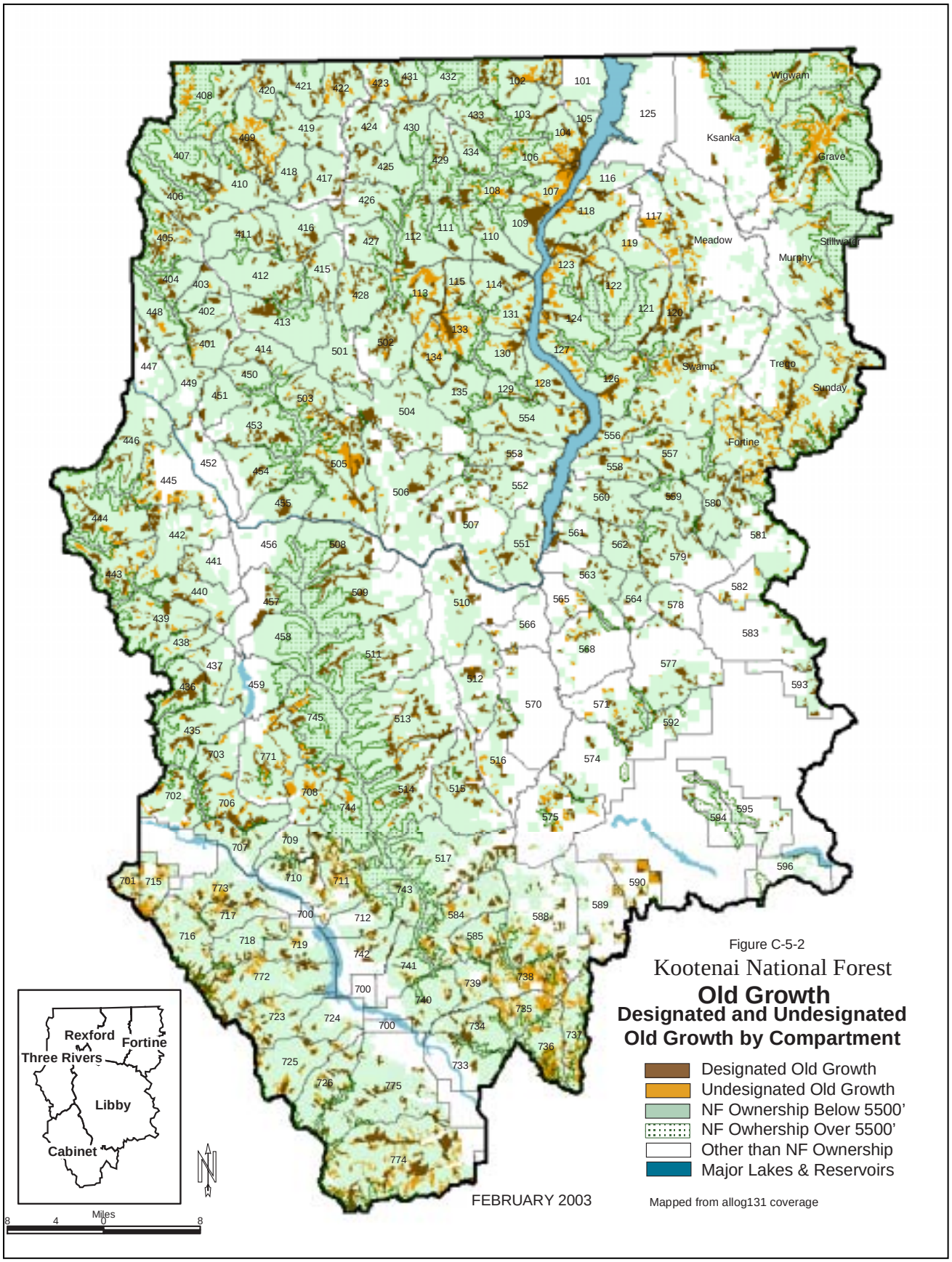
FEBRUARY 2003
Figure C-5-1
Kootenai National Forest
Old Growth
Effective and Replacement
Old Growth by Compartment
Effective Old Growth
Replacement Old Growth
Unvalidated Old Growth
NF Ownership Below 5500'
NF Owhership Over 5500'
Other than NF Ownership
Major Lakes & Reservoirs
Mapped from allog131 coverage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FEBRUARY 2003
Figure C-5-2
Kootenai National Forest
Old Growth
Designated and Undesignated
Old Growth by Compartment
Designated Old Growth
Undesignated Old Growth
NF Ownership Below 5500'
NF Owhership Over 5500'
Other than NF Ownership
Major Lakes & Reservoirs
Mapped from allog131 coverage

WILDLIFE & FISHERIES: Cavity Habitat; Monitoring Item C-6

ACTION OR EFFECT TO BE MEASURED:	Cavity habitat condition and amount.
MONITORING OBJECTIVE:	Maintain habitat capable of supporting viable populations of cavity nesters (> 40% of potential).
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Any reduction in habitat capability approaching 40 percent of potential.

Purpose: This monitoring item was established to help ensure that adequate amounts of habitat are provided for cavity-nesting species. The expected accuracy and reliability of the information is moderate. The Forest Plan requires that this item be reported once every five years.

Background: Appendix 16 of the Plan contains the standards and guidelines for maintaining habitat capable of supporting populations of cavity-nesting wildlife. The primary goal is to maintain viable populations of cavity dependent wildlife species throughout the forest. To achieve this goal at least 40% (1 snag per acre) of the potential capacity will be maintained throughout commercial forest lands and at least 60% (1.5 snags per acre) of the potential will be maintained in riparian areas. The 40 percent population level is considered the minimum level necessary to maintain viable populations. The management indicator species for cavity nesters is the pileated woodpecker, which is discussed in Monitoring Item C-4. Appendix 16 provides the Forest with the option of achieving cavity habitat requirements at either the stand level or the drainage or compartment level. It identifies the minimum density of dead trees (snags) or live cull trees within certain height and diameter criteria needed to meet various levels of population potential (40% to 100%). Live cull trees are usually broken-topped, or have significant amounts of decayed wood. These dead and dying trees are considered to be the critical habitat indicator for cavity nesters.

Results: The results used for this monitoring item are derived from two sources; 1) District analysis conducted during the NEPA process (generally on a timber compartment or watershed), and 2) on-the-ground monitoring of individual harvest units. Available Snag Habitat (ASH) or habitat capability is determined on a compartment or watershed basis using various assumptions for existing snag numbers. These assumptions vary by District but they all include an estimate of snags in treated and untreated acres of National Forest lands, based on information from the timber stand database. Factors included in the calculations are: acres of harvest (regeneration and/or intermediate), acres of non-harvest, acres of natural openings, and miles of road. Assumptions are made about the number of snags available in each of these areas. Because of firewood cutting no snags are assumed to occur within a specified distance from a road. The distance varies by district but is generally from 100-200 feet. Past regenerated stands and natural openings were also considered to have very minimal amounts of snags (<10% ASH). Uncut and partially cut stands were assumed to have a 40-100% ASH. On-the-ground monitoring is usually conducted post harvest where actual snag numbers are counted. During the reporting period (1998-2002), on-the-ground monitoring was conducted on 459 individual harvest units (Table C-6-1) and analysis was conducted on 62 compartments (Table C-6-2).). Table C-6-1 and C-6-2 display the results of both the 5 year and 15 year monitoring results.

Individual Harvest Unit Results: Pre-treatment habitat capability within harvest units was generally considered to be 100 percent of potential habitat (it requires 2.25 snags per acre to achieve the 100 percent level). Post-treatment habitat capability ranged from zero percent of potential to 100 percent of

potential. Overall, adequate snag numbers were retained in about one half of the harvest units monitored in order to meet or exceed the 40% level. Over the 15 year monitoring period over half of all harvest units retained adequate numbers of snags to contribute toward meeting Forest Plan standards at the compartment level. Monitoring of harvest units also includes counting the number of green tree replacements. These replacement trees are often girdled or inoculated to initiate decay processes that will create snags. Results of these treatments are variable but generally take many years to achieve a desired result. Only existing snags were included in the calculations for habitat capability. If replacement trees were included in the calculations the number of units meeting Forest Plan direction would greatly increase.

Table C-6-1 **Individual Units Monitored 1988-2002**

Year	Units Monitored	Units with ≥0.9 snags/ac *	Units with < 0.9 snags/ac *
1988-1992	303	177 (58.4%)	126 (41.6%)
1993-1997	624	390 (62.5%)	234 (37.5%)
1988-2002	1386	781 (56.3%%)	605 (43.7%)
1988-2002	1386	781 (56.3%)	605 (43.7%)

* 40% level is 100% level x .4 (2.25 x .4 = 0.9 snags/acre)

Compartment Level Results: Evaluation of cavity habitat trend was completed on 62 compartments (see Table C-6-2) during the reporting period (1998-2002). Based on the evaluations almost all of the compartments (97%) retained adequate snag numbers to meet or exceed forest plan goals for the 40% level. Over the past 15 years 95% of all compartments analyzed met Forest Plan standards for cavity habitat.

Table C-6-2 **Compartments Analyzed 1988-2002**

Year	Compartments Monitored	Compartments Meeting FP Standards	Compartments Not Meeting FP Standards
1988-1992	74	68 (91.9%)	6 (8.1%)
1993-1997	66	64 (97.0%)	2 (3.0%)
1988-2002	202	192 (95.0%)	10 (5.0%)
1988-2002	202	192 (95.0%)	10 (5.0%)

Forest-wide Results: Monitoring results showed that overall there is a high percentage of compartments that meet Forest Plan guidelines for cavity habitat, although the percentage of individual harvest units meeting Forest Plan guidelines is much less. Overall, considering both harvested and unharvested acreages the 40% cavity habitat potential is being met in most drainages because of the amount of unharvested timber still remaining.

Evaluation: Monitoring results to date provide evidence that there are mixed results in providing the minimum desired density of snags in harvest units (Table C-6-1). This is due to several factors including the felling of snags for safety reasons during harvest, lack of available snags to begin with in certain vegetation types, and loss of snags to firewood cutters. Improvement in retaining snags is occurring. With the new OSHA regulations, the emphasis is on leaving snags in clumps or stringers that are not harvested and retaining green replacement trees versus existing snags.

Wildfires that created large numbers of snags burned almost 100,000 acres of the Kootenai in 1994 and 2000. Only a minor proportion of those areas (about 10% of the 53,000 acres that burned in 1994) were

harvested leaving large areas where all fire-created snags were retained. Within those areas that were harvested many snags were retained in harvest units or in adjacent clumps and stringers. Not all of these acres were included in projects due to roadless area and other resource concerns.

In summary, the available monitoring data indicates the Forest is providing sufficient cavity habitat at a drainage or compartment level. Based on this information, the creation of numerous snags by the wildfires, and the existence of ample cavity habitat in the majority of the Forest that is outside the suitable timber base, this monitoring item is within acceptable limits of the Plan.

Recommended Actions: New scientific information concerning snags (Bull et. al. 1997 and Harris unpub.) has become available and may apply to snag management on the Kootenai. The Plan snag standards and guidelines are primarily based on Thomas (1979). Bull documents that the assumptions used by Thomas were in error and that additional snag habitat, more snags and replacement trees, may be needed to provide adequate habitat for cavity nesters. A review of the snag requirements should be completed during Forest Plan revision.

WILDLIFE & FISHERIES: T & E Species Habitat; Monitoring Item C-7

ACTION OR EFFECT TO BE MEASURED: Provide habitat adequate to ensure Kootenai NF's contribution to recovery of Threatened and Endangered (T&E) Species including: Gray Wolf, Bald Eagle, Grizzly Bear, Bull Trout and White Sturgeon.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Any downward population trend. Any Forest-wide decrease in habitat quantity or quality. Failure to meet recovery plan goals for the Kootenai NF.

Purpose: This monitoring item was established to help ensure that the Kootenai National Forest contributes to the recovery of listed threatened and endangered species. The Forest Plan requires that this item be reported annually. The expected precision and reliability of the information are high and moderate, respectively.

Evaluation:

Gray Wolf: The Wolf Recovery Plan (USFWS, 1987) provides guidance for the recovery of the gray wolf. The Kootenai National Forest is part of the Northwest Montana Wolf Recovery Area. The recovery goal for this recovery area is 10 wolf packs.

In 2002, reports of wolf sightings continued at about the same level as recent years, but sightings were more localized near the areas of known packs. Sightings were reported on all districts.

Eight black wolves were released near the Caribou Campground in the Yaak River valley. All were equipped with radio collars. The group consisted of an adult female, a sub-adult male, and six pups. The wolves dispersed across northern Idaho and western Montana. They were tracked around the town site of Yaak on several occasions.

The following are the identified wolf packs on the Kootenai: Murphy Lake, Grave Creek, Little Wolf, Fishtrap, and Wigwam. The USFWS confirmed a new pack (Green Mountain) in 2002. Wolves from each of the known packs spend a portion of their time on the Forest and the remainder on other National Forests, State, or private lands. The Wigwam pack spends a majority of its time in Canada, and USFWS does not count it toward the 10-pack recovery goal for northwest Montana. A possible pack on the east side of Lake Koocanusa (Ural pack) has been observed but no wolves captured or radio collared.

The following is a brief summary of each of the known wolf packs during 2002:

Murphy Lake pack – There are three adults, two with radio-collars, in this pack. Aerial locations revealed that the pack denned in 2002, and subsequently had 3 pups. There was a mortality due to a vehicle collision. There were no depredations reported this year. They use habitat southwest of Highway 93.

Grave Creek pack – The pack consists of 4 adults and 1 pup. One radio collared animal remains in the pack. There were 3 depredations on cattle and one on a dog by this pack in 2002. There were no wolf mortalities in the pack this year. The pack spends most of its time east of Highway 93, with excursions to the Flathead Forest and Canada.

Wigwam pack – There are no radio-collared wolves remaining in this pack. There were no credible sightings of wolves from this packs' former territory in 2002.

Little Wolf pack – This pack is no longer considered an established pack. They had been using the Pleasant Valley and Wolf Prairie areas.

Fishtrap Pack – The pack was confirmed to have 7 individuals in May but only 4 in December of 2002. The fate of the 3 missing members is unknown. The pack occupies an area in the southeast corner (McGinnis Meadows and East Fisher Creek) of the Libby District, but also uses the Fishtrap and main Thompson River drainages on the Plains/Thompson Falls District of the Lolo National Forest. There were no reported mortalities this year.

Green Mountain Pack – The USFWS confirmed this new pack on the Cabinet district. It consists of the adult pair and 5 pups. They trapped and radio collared 2 pups. The pack uses the west side of the Cabinet Mountains, but has been found in the upper Silver Butte drainage on the Libby district.

The components of wolf habitat on the Kootenai did not change significantly in 2002 compared to previous years. Big game populations have rebounded from the severe winter of 1996-97, and they are providing adequate prey resources for continued growth in the wolf population. Big game habitat shows improvement (see monitoring report item C-1).

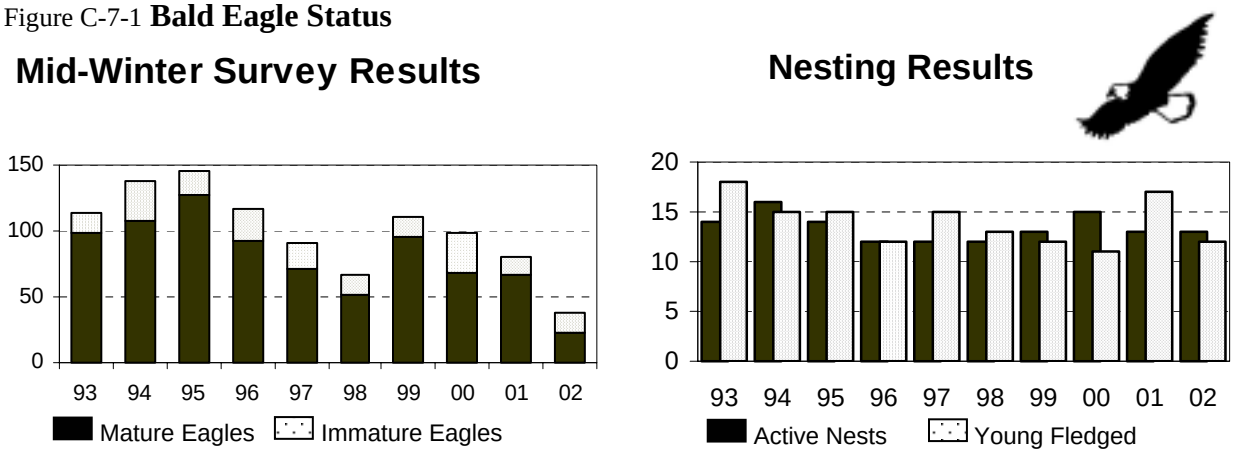
Bald Eagle: The Montana Bald Eagle Management Plan (MBEWG, 1994) and the Pacific States Bald Eagle Recovery Plan (USFWS, 1986) provide guidance for bald eagle recovery. These plans call for the establishment of 52 nesting pairs within Recovery Zone 7, the Montana section of the Upper Columbia River Basin. This recovery zone includes all public and private land west of the continental divide in Montana. The Kootenai National Forest area is about 15 percent of the zone.

Bald eagle habitat is generally within one mile of major lakes and rivers. Habitat quality and quantity on the Kootenai is stable, and may be increasing in the long term as potential nest trees mature.

Figure C-7-1 shows the results of mid-winter bald eagle population surveys. Sightings occur mostly along major watercourses both on the Forest and on adjacent ownerships. Results are highly variable from year to year due to varying weather conditions. The survey results for 2002 show an all time low for the 18 years of records (Note: one district did not report in 2002). A total of 23 mature and 15 immature bald eagles were observed.

Numbers of active eagle nests and young eagles fledged are also shown in Figure C-7-1. Nesting surveys show the 2002 nesting eagle population continuing at similar levels as the past few years. Twelve young were fledged from thirteen active nests. USFWS believes the bald eagle has achieved recovery goals and they've proposed removing them from the threatened species list.

Figure C-7-1 **Bald Eagle Status**



Beginning in FY96, eagle nest results reflect only nests occurring on National Forest lands. Previous years' data reflect nests on other ownerships as well as National Forest.

Grizzly Bear: The Kootenai National Forest contains portions of two grizzly bear recovery zones: the Cabinet-Yaak Ecosystem (CYE) and the Northern Continental Divide Ecosystem (NCDE). About 72 percent of the CYE is located on the western portion of the Forest and about 4 percent of the NCDE is located in the extreme northeast corner (see Figure C-7-3). Each of these ecosystems is further subdivided into smaller areas for analysis and monitoring, known as bear management units (BMUs).

The Forest's primary efforts in grizzly bear recovery are in habitat management, cooperating in grizzly bear studies in the Yaak River and Cabinet Mountains areas, and working with local citizens and interest groups to achieve understanding and consensus on grizzly bear management issues.

Recovery goals for each recovery zone are based on the Grizzly Bear Recovery Plan (USFWS, 1993). Three main criteria are used to evaluate grizzly bear recovery: 1) the number of unduplicated sightings of females with cubs averaged over a six-year period; 2) the distribution of females with cubs, yearlings, or two-year-olds measured as the number of BMUs occupied over a six-year period; and 3) the level of known human-caused mortality measured as a percentage of the estimated population average for the past three years. Habitat is also an important factor in grizzly bear recovery. The Forest monitors habitat effectiveness in each BMU as an indicator of habitat trend.

Habitat Effectiveness: Figure C-7-2 and Table C-7-1 show habitat effectiveness values for each of the BMUs evaluated during fiscal years 1992-2002. Effectiveness is based on the percent of habitat available to bears, and the desired level is 70 percent or more. Habitat effectiveness was maintained in all BMUs, except 3 BMUs improved in FY02 compared to FY01. Activities on private lands can affect habitat effectiveness within BMUs, and the Forest Service has no authority over these activities or their effects on grizzly bear habitat effectiveness. Fifteen of the 18 BMUs were at or above the desired 70 percent level (improvement over FY01), and the Forest-wide average for all BMUs remained 73 percent, slightly above the average for the past 10 years. Figure C-7-3 displays the status of the BMUs.

Figure C-7-2 **Grizzly Bear Habitat Effectiveness**

Number of BMUs that meet 70 Percent H.E.

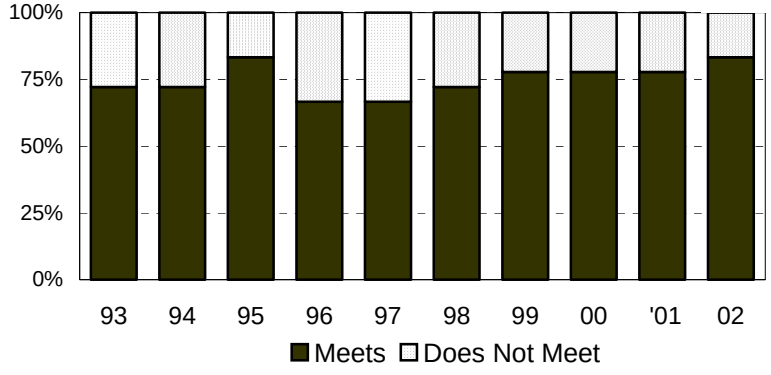
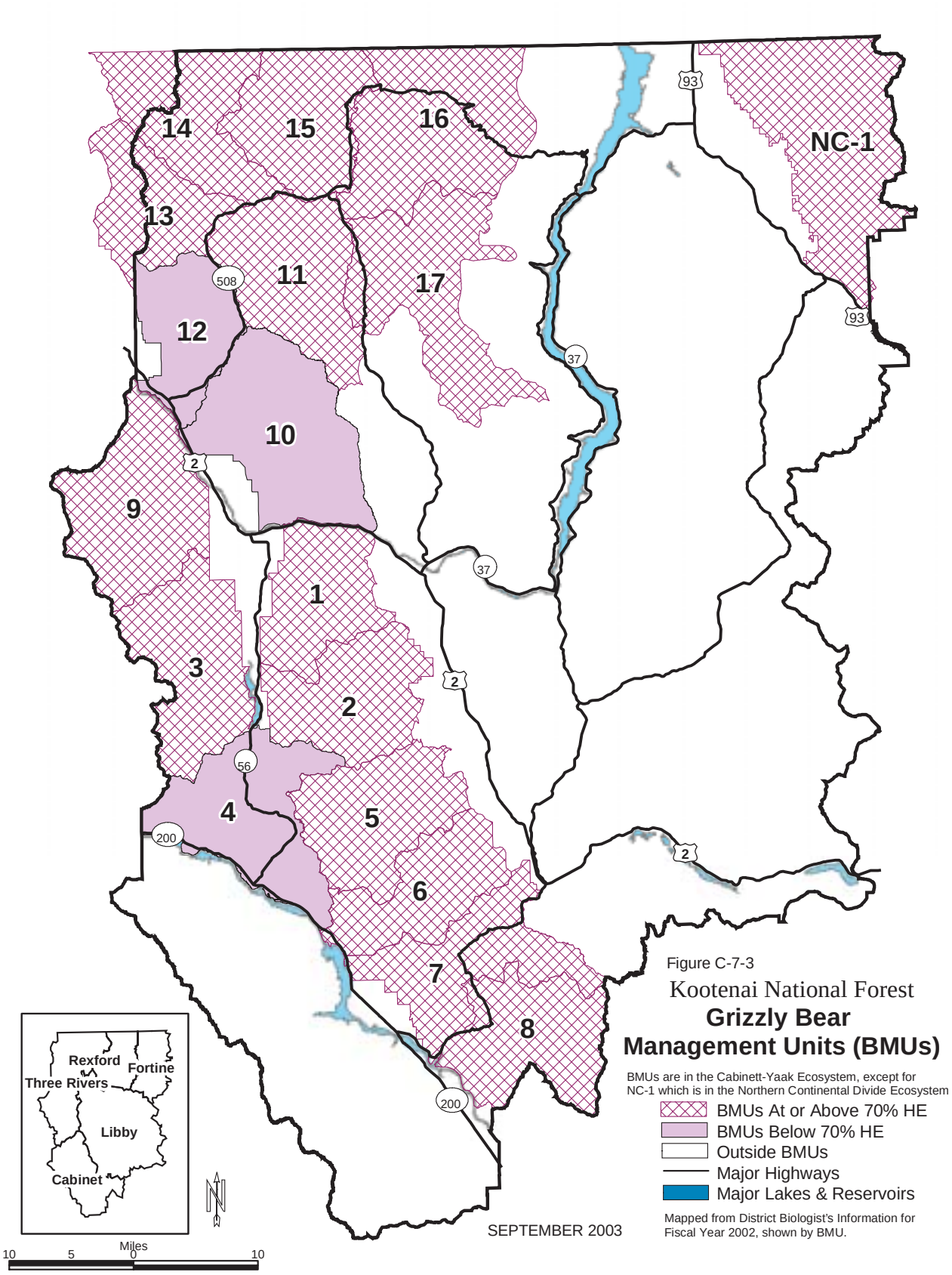


Table C-7-1 **Grizzly Bear Habitat Effectiveness by Fiscal Year**

Grizzly Bear Management Unit (BMU)	R.D	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
#NC-1 Murphy Lake	3	78%	78%	78%	78%	76%	76%	76%	76%	76%	77%	77%
#1 Cedar	(4) 5	79%	79%	86%	81%	81%	86%	85%	88%	89%	88%	89%
#2 Snowshoe	4 (5) 7	82%	82%	84%	85%	85%	85%	83%	85%	69%	83%	83%
#3 Spar	4	79%	78%	77%	77%	78%	76%	78%	78%	76%	70%	70%
#4 Bull	7	80%	92%	64%	63%	63%	62%	62%	62%	65%	65%	65%
#5 Saint Paul	(5) 7	78%	81%	75%	74%	73%	74%	75%	74%	75%	75%	75%
#6 Wanless	(5) 7	76%	76%	71%	72%	66%	66%	68%	67%	69%	69%	70%
#7 Silver B/Fisher	(5) 7	87%	82%	82%	82%	82%	81%	81%	79%	80%	80%	80%
#8 Vermilion	7	73%	71%	71%	74%	77%	77%	77%	73%	77%	77%	77%
#9 Callahan	4	70%	74%	74%	76%	76%	76%	73%	71%	72%	72%	72%
#10 Pulpit	(4) 5	54%	65%	65%	70%	68%	57%	57%	61%	65%	65%	65%
#11 Roderick	(4) 5	66%	70%	70%	70%	74%	74%	70%	73%	73%	71%	71%
#12 Newton	4	53%	49%	49%	49%	62%	57%	44%	62%	60%	60%	60%
#13 Keno	4	69%	70%	72%	73%	72%	72%	72%	71%	72%	72%	72%
#14 Northwest Pk	4	68%	72%	74%	72%	74%	74%	74%	71%	75%	75%	75%
#15 Garver	4	54%	65%	65%	70%	68%	63%	66%	70%	70%	70%	70%
#16 E Fork Yaak	1 (4)	62%	64%	64%	73%	72%	70%	70%	74%	70%	72%	72%
#17 Big Creek	(1)4 5	64%	68%	70%	68%	68%	68%	71%	71%	73%	73%	74%
Forest-wide Average		**71%**	**73%**	**72%**	**72%**	**73%**	**72%**	**71%**	**73%**	**73%**	**73%**	**73%**

Shaded entries indicate BMUs that were below 70 percent Habitat Effectiveness standard for that Fiscal Year.
BMU NC1 Murphy Lake is in the Northern Continental Divide Ecosystem. All other BMUs are in the Cabinet Yaak Ecosystem.
( ) in the Ranger District (R.D.) column indicates the lead District for information reporting.


14
15
16
NC-1
13
11
17
12
10
9
1
3
2
4
5
6
7
8
93
508
37
2
56
200
Rexford
Fortine
Three Rivers
Libby
Cabinet
Miles
10
5
0
10
SEPTEMBER 2003
Figure C-7-3
Kootenai National Forest
Grizzly Bear
Management Units (BMUs)
BMUs are in the Cabinett-Yaak Ecosystem, except for NC-1 which is in the Northern Continental Divide Ecosystem
BMUs At or Above 70% HE
BMUs Below 70% HE
Outside BMUs
Major Highways
Major Lakes & Reservoirs
Mapped from District Biologist's Information for Fiscal Year 2002, shown by BMU.

Unduplicated Sightings of Females with Cubs: In FY02, there were six credible sightings of 4 unduplicated female grizzly bears with cubs in the Kootenai portion of the CYE (Kasworm 2003). There were two confirmed unduplicated sightings of female grizzlies with cubs in the Kootenai portion of the NCDE in FY02. The NCDE was above the 6-year average for number of females sighted with cubs, while the CYE was below the average.

Distribution of Females with Young: Twelve of the 17 BMUs on the Kootenai portion of the CYE were occupied by females with young in FY02. The total number of different BMUs occupied over the entire recovery zone during the past 6 years was 13, compared to the Recovery Plan goal of 18 (Kasworm 2003). The one BMU in the Kootenai's portion of the NCDE was also occupied by a female with young during the year. These numbers are slightly below the 6-year average for the CYE and slightly above the average for the NCDE.

Mortality: A single human caused mortality was reported in the CYE in FY02. It was a sub-adult female killed in BMU 16 (Kasworm 2003). Considering the mortality and cub production over the past 6 years, the confidence interval for population trend does not allow us to conclude that the population is either increasing or decreasing (Wayne Kasworm: pers. comm. with Wayne Johnson 9/27/03). There were no reported grizzly bear mortalities in the Kootenai portion of the NCDE in FY02.

Sightings of females with cubs of the year, distribution of females with young, and human-caused moralities are summarized for the past six years in Table C-7-2.

Table C-7-2 **Grizzly Bear Females with Cubs, Distribution of Females with Young, and Human-Caused Mortalities**

Fiscal Year	NCDE			CYE		
	# Females with Cubs of the year	#BMUs Occupied by Females with Young	# Human Caused Mortalities	# Females with Cubs of the year	# BMUs Occupied by Females with Young	# Human Caused Mortalities
1997	2	1	*1	3	7	1
1998	2	1	0	0	4	0
1999	0	0	0	0	1	2
2000	2	1	0	2	3	1
2001	2	1	2	1	3	1
2002	2	1	0	4	7	1
Six-year Average	1.7	1 **	0.5	1.7	13 **	1.0

*Outside Recovery Zone

** the number (i.e. 13) is the total number of different BMUs occupied over the past 6 years. The CYE recovery Plan goal is 18.

Access Management: The SCYE Subcommittee Access Task Group is currently working to refine access management guidance for the ecosystems based on the latest scientific information on the effects of human access on local grizzly bear populations. Interim options for analyzing access management parameters were tentatively agreed upon by these groups in December 1998. The monitoring parameters agreed upon included: core area, open motorized route density (OMRD), and total motorized route density (TMRD). As a result of a lawsuit in the CYE, implementation of the CYE Subcommittee's interim direction has been deferred. The current strategy for the CYE is to apply the USFWS's mandatory requirements in the revised Forest Plan Biological Opinion (USFWS 1995) of no net loss in core area and

no net increase in OMRD or TMRD in any BMU. A Forest Plan amendment has been initiated as part of the lawsuit settlement to establish further access management direction in the CYE. The final EIS was released in March 2002. The Record of Decision (ROD) is expected by the end of 2003.

Tables C-7-3A and B below and map, Figure C-7-4, display Core, OMRD, and TMRD by BMU in comparison to previous years. The data for FY02 shows changes in core, OMRD and TMRD, which are the result of management activities, activities on private land, and field verified corrections in road status from FY01.

Table C-7-3A **Baseline and Annual Core Conditions for the CYE**

BMU	FY98 Core %	FY99 Core %	FY00 Core %	FY01 Core %	FY02 Core %
1 Cedar	69	84	83	83	83
2 Snowshoe	-	77	78	77	77
3 Spar	-	57	58	61	62
4 Bull	62	61	63	63	62
5 Saint Paul	60	61	62	62	63
6 Wanless	51	51	53	55	55
7 Silver Butte/Fisher	65	66	66	66	66
8 Vermilion	54	57	57	56	56
9 Callahan	-	53	56	57	57
10 Pulpit	42	45	48	49	49
11 Roderick	52	52	55	54	54
12 Newton	-	56	56	57	57
13 Keno	58	56	59	62	62
14 NW Peak	58	60	56	56	56
15 Garver	35	46	48	47	50
16 E Fk Yaak	38	40	45	45	45
17 Big Creek	32	42	49	50	50
Average	52	57	58	59	59

Baseline and Annual Core Conditions for the NCDE

BMU	FY98 Core %	FY99 Core %	FY00 Core %	FY01 Core %	FY02 Core %
Krinkelhorn NC-1A	69	69	72	72	72
Therriault NC-1B	69	69	69	69	72
Average	69	69	70	70	72

Table C-7-3B **Baseline and Annual OMRD and TMRD Conditions for the CYE**

BMU	% BMU Where the OMRD >1mi/sqmi					% BMU Where the TMRD >2mi/sq.mi.				
	FY98	FY99	FY00	FY01	FY02	FY98	FY99	FY00	FY01	FY02
1 Cedar	23	13	12	12	12	16	9	11	11	10
2 Snowshoe	-	18	17	17	17	-	15	14	14	14
3 Spar	-	23	24	26	27	-	31	30	27	26
4 Bull	39	39	36	36	36	28	27	26	26	26
5 Saint Paul	29	28	27	27	26	23	21	21	21	21
6 Wanless	37	32	34	34	33	35	34	33	32	32
7 Silver Butte/Fisher	27	23	23	23	23	22	19	20	20	20
8 Vermilion	32	11	32	32	32	23	21	21	23	23
9 Callahan		36	32	32	32		31	28	27	27
10 Pulpit	50	50	45	41	41	41	37	34	32	32
11 Roderick	32	33	29	29	31	31	31	27	28	28
12 Newton	-	43	45	43	43	-	28	31	29	30
13 Keno	34	37	34	33	28	23	26	24	24	24
14 NW Peak	31	32	28	35	28	24	22	26	26	26
15 Garver	32	30	31	31	31	45	34	32	32	30
16 E Fk Yaak	38	36	31	28	29	45	42	38	38	38
17 Big Creek	43	37	32	32	31	44	33	27	26	26
Average	34	29	28	30	28	31	27	26	26	24

Baseline and Annual OMRD and TMRD Conditions for the NCDE

BMU	% BMU Where the OMRD >1mi/sq.mi					% BMU Where the TMRD >2mi/sq.mi.				
	FY98	FY99	FY00	FY01	FY02	FY98	FY99	FY00	FY01	FY02
Krinkelhorn NC-1A	24	24	24	24	22	17	17	17	17	5
Therriault NC-1B	22	22	17	17	17	14	14	8	8	8
Average	23	23	20	20	19	15	15	12	12	6

Summary: Overall, grizzly bear habitat effectiveness remained about the same as in FY01, and is above the desired level of 70 percent Forest-wide. Eighty-three percent of BMUs meet the desired 70 percent habitat effectiveness level.

Sightings of female grizzly bears with cubs were up from FY01, as was the six year average. Females with young occupied the same numbers of BMUs as in the previous year. There was one human caused mortality of a sub-adult female bear. Overall, open and total road densities declined slightly during the year. The amount of core area in grizzly habitat slightly increased during the year. The grizzly bear population trend in the CYE is being prepared by the USFWS and should be available by the end of 2003.

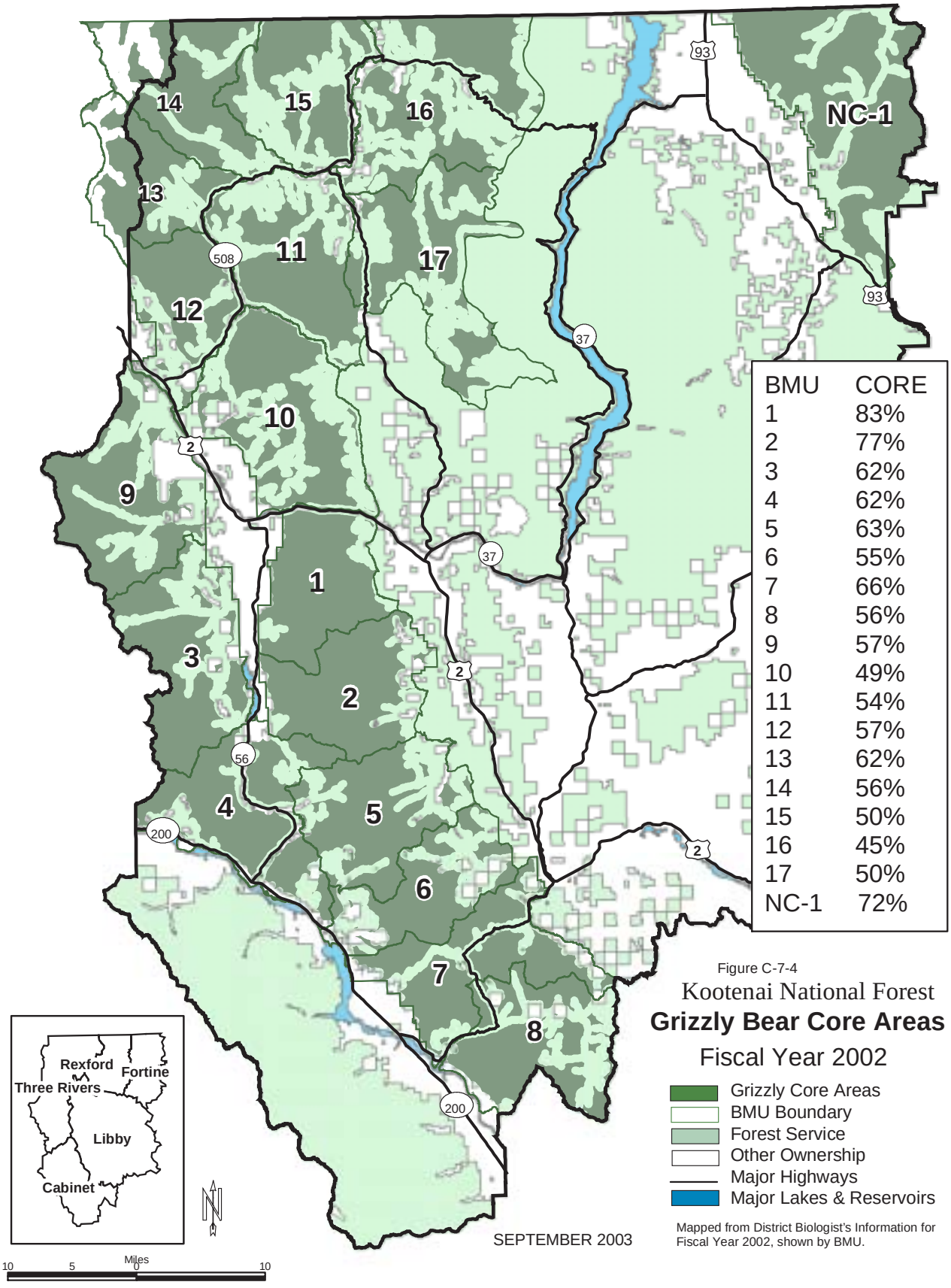
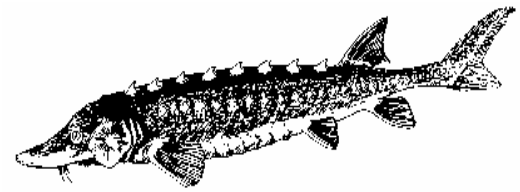


Figure C-7-4

Kootenai National Forest

Grizzly Bear Core Areas

Fiscal Year 2002



White Sturgeon -- The USFWS Recovery Plan for the Kootenai River white sturgeon was signed 30 September 1999. The short-term goals of the Plan are to reestablish natural reproduction and prevent extinction of the species. Long-term goals include providing suitable habitat conditions and restoring a natural age-class structure and an effective population size. This stock of fish will be considered for downlisting to threatened status after 10 years only if natural reproduction occurs in three different years; the estimated population is stable or increasing; enough captive-reared juveniles are added to the population for 10 consecutive years that 24 to 120 juveniles survive to maturity; and a long-term Kootenai River Flow strategy is implemented that ensures natural reproduction. Delisting of this population is estimated to take at least 21 more years.

The Recovery Plan for the white sturgeon outlines a comprehensive set of actions needed to begin the recovery process. The Plan does not identify actions or objectives that directly affect management of the Kootenai National Forest. However, under the Endangered Species Act (Section 7(a)(1)), the Forest is obligated to use its authorities to aid in the recovery process and to consult with the USFWS on all proposed or authorized activities. All proposed projects and activities evaluated by the Forest in FY02 were found to have No Effect on the species.

In December 2000, the U.S. Fish and Wildlife Service issued a biological opinion stating that Libby Dam is the primary factor affecting the Kootenai River white sturgeon. The Fish & Wildlife Service also designated 11.2 miles of river below Bonners Ferry, ID as critical habitat.

The most recent population estimate from the Idaho Department of Fish and Game indicates there are approximately 600 adult sturgeon in the population. Natural reproduction has been confirmed in the Kootenai River. Currently the majority of juvenile fish in the population are hatchery-reared fish.

Bull trout -- The Forest continues to work closely with the five other western Montana National Forests, Bureau of Land Management and the USFWS to implement Programmatic Biological Assessments and maintain consistency for consultation standards.

There was one new project evaluated by the Forest that May Affect but is Not Likely to Adversely Affect bull trout. In addition, there were two recovery action projects covered under a Regional FWS 10(a)(1)(A) permit. They were the Pipe Creek Habitat Enhancement and the South Fork Bull River Enhancement Projects. The Forest also submitted the Forest Plan Access Amendment which required formal consultation as its implementation is Likely to Adversely Affect bull trout. The remainder of new projects evaluated was determined to have No Effect on the species. The USFWS continues to develop a recovery plan. The USFWS has postponed their development of a final rule listing critical bull trout habitat. The Forest continues to work closely with Montana Fish Wildlife and Parks and the USFWS to determine distribution and abundance of bull trout within the boundaries of the Kootenai National Forest. No new areas of bull trout habitat were identified in 2002.

Blueprints of completed structures and fish density surveys were completed for the Pipe Creek Enhancement Project to determine effectiveness. Redd counts completed for fall 2002 identified 199 bull trout redds above the Glen Lake Irrigation District diversion which was improved as a recovery action in 2001. This number is nearly three times the annual redd count numbers for Grave Creek counted prior to the implementation of the project. It is our hope that the Pipe Creek Enhancement Project will show similar results.

Recommended Actions: Based upon the best available information, populations of all threatened or endangered terrestrial species on the Kootenai are stable or increasing. The bald eagle is proposed for

removal from the threatened and endangered list. All of the threatened and endangered species' habitats being monitored appear to be maintaining or improving. The information shows that the Kootenai National Forest is progressing toward providing adequate habitat for threatened and endangered species recovery. Based on review of this item, specific changes, other than the proposed access amendment, to Forest Plan direction are not needed at this time.

As with the terrestrial species, the bull trout population on the Forest appears to be increasing in number. Ongoing population research on the white sturgeon determined that while there has been successful spawning (in 1997), estimates of the adult population have been reduced. Furthermore, a recovery plan is now in place with specific goals and recovery actions. Recovery of white sturgeon is managed by the Kootenai Tribe of Idaho, and the states of Idaho and Montana. Bull trout redd count numbers were commensurate with previous years with a notable increase in Grave Creek. It is recommended that the Forest continue to implement recovery actions and actively seek to improve connectivity of bull trout populations.

Literature Cited:

Kasworm, Wayne; H. Carriles, and T.G. Radandt. 2003 (DRAFT). Cabinet-Yaak Grizzly Bear Recovery Area 2002 Research and Monitoring Progress Report. USFWS, U. of M. Missoula, MT.

MBEWG. 1994. Montana bald eagle management plan. Montana Bald Eagle Working Group. Bureau of Reclamation, Billings, MT. 104 pp.

USFWS. 1987. Northern Rocky Mountain wolf recovery plan. U.S. Fish and Wildlife service, Denver, CO. 67 pp.

USFWS. 1986. Recovery plan for the Pacific bald eagle. U.S. Fish and Wildlife Service, Portland, OR. 160 pp.

USFWS. 1993. Grizzly bear recovery plan. U.S. Fish and Wildlife Service, Missoula, MT. 181 pp.

USFWS 1995. Amended biological opinion on the Kootenai Forest Plan. U.S. Fish and Wildlife Service, Helena, MT. 15 pp.

WILDLIFE & FISHERIES: Indicator Species; Monitoring Item C-8

ACTION OR EFFECT TO BE MEASURED:	Determine habitat and population trends for viable populations of Indicator Species.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Any reduction approaching minimum habitat needed for viable population levels (40% of potential population).

Purpose: This monitoring item was established to help ensure that habitat was provided for the identified indicator species on the Forest. The Forest Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information are moderate.

Background: The list of indicator species on the Kootenai Forest can be found in Volume 2, Appendix 12 of the Plan. The species include grizzly bear**,** gray wolf, bald eagle, peregrine falcon, elk, whitetail deer, mountain goat, and pileated woodpecker.

Results and Evaluation (by species):

Grizzly Bear: The Kootenai National Forest contains portions of two grizzly bear recovery zones: the Cabinet-Yaak Ecosystem (CYE) and the Northern Continental Divide Ecosystem (NCDE). About 72 percent of the CYE is located on the western portion of the Forest and about 4 percent of the NCDE is located in the extreme northeast corner (see Figure C-7-3). Grizzly bear habitat effectiveness improved over the last 15 years and is above the desired level of 70 percent Forest-wide, although some BMUs remain below this level. Sightings of female grizzly bears have increased, as well as their distribution. There were six mortalities in the last six years in the Kootenai portion of the CYE, and 3 in the NCDE. Based on this analysis grizzly bear habitat is improving and the population appears to be static. More complete information about the monitoring for grizzly bear habitat and population can be found in Monitoring Item C-7.

Gray Wolf: The Wolf Recovery Plan (USFWS, 1987) provides guidance for the recovery of the gray wolf. There is one recovery area within and adjacent to the Kootenai Forest (the Northwest Montana Recovery Area). The recovery goal for this area is 10 wolf packs.

Over the past 15 years, reports of wolf sightings have varied with a slight increase over the past 5 years. Sightings were noted in areas on all Ranger Districts. Many of these were sightings of individuals from known packs (see Item C-7). In addition, new pack activity was confirmed on the Cabinet Ranger District (see Item C-7). Most of the components of wolf habitat on the Kootenai did not change significantly in 2002 compared to previous years. However, big game populations, which are the primary prey for wolves, have recovered from declines caused by the severe winter of 1996-97 (see monitoring items C-2 and C-7). At this time, wolf populations are increasing and adequate habitat is provided for their primary prey base.

Bald Eagle: The Montana Bald Eagle Management Plan (MBEWG, 1994) and the Pacific States Bald Eagle Recovery Plan (USFWS, 1986) provide guidance for bald eagle recovery. These plans call for the establishment of 52 nesting pairs within Recovery Zone 7, which is the Montana section of the upper Columbia River Basin. This recovery zone includes all public and private land west of the continental divide in Montana, and the Kootenai Forest area is about 15 percent of the zone.

Bald eagle habitat is generally within one mile of major lakes and rivers. Habitat quality and quantity on the Kootenai is stable, and may be increasing in the long term as potential nest trees mature. Monitoring Item C-7 shows the results of mid-winter bald eagle surveys which occur mostly along major watercourses both on the Forest and on adjacent ownerships. Although the results vary somewhat from year to year due to varying weather conditions, the surveys indicate stable numbers of wintering bald eagles during the reporting period. Nesting surveys also show an increasing nesting eagle population during the first half of the reporting period, and a relatively stable population thereafter.

Peregrine Falcon: One or two peregrine falcons per year are observed on average on the Kootenai National Forest. Nesting activity has not been confirmed. Peregrine sightings on the Kootenai may be the result of a hacking (release) program further down the Clark Fork River on the Idaho Panhandle National Forest. Suitable nesting habitat on the Kootenai is localized and not abundant. Due to the steep, cliffy nature of peregrine nesting habitat, activities which could lead to adverse impacts are rare. Peregrine falcons appear to be maintaining their rare presence on the Kootenai.

Elk: The aerial survey data on elk numbers show an increase since the item was last reported in 1997. The numbers of elk observed during surveys increased from 833 in 1997 to 1,778 in 2002, with incremental increases each of the last 5 years. The number of calves per 100 cows also shows the same upward trend, going from 18 (1997) to 31 (2002). Elk populations increased through 1990 or 1991 and then had a gradual decrease until 1997. The downward trend appears to have changed over the most recent 5-year reporting period (1998-2002). The number of spike bulls observed show an increase which is another indication of recruitment into the population. More information may be found in Monitoring Item C-2. Elk habitat has been improving over the past 5 years (see Item C-1 for details).

Whitetail Deer: This species is the most widespread and abundant big game animal on the Forest. The whitetail deer numbers show a significant recovery from the effects of the severe winter conditions of 1996-1997. Montana Fish, Wildlife and Parks officials have restored the week-long either-sex whitetail season in all hunting districts that cover the Kootenai National Forest. Habitat conditions for whitetail deer show improvement is some areas (i.e. better security due to access management changes – see Item C-1) and slight declines in others (i.e. reductions of cover on winter range due to management activities designed to reduce fuels in the urban interface and activites on private land, such as subdivision).

An up-and-down pattern in whitetail populations is typical of how the species responds to weather conditions in northern heavy-snow regions, and does not appear to be directly related to management actions of the Forest Plan standards for winter range. The standards emphasize small opening sizes and retention of cover, and would tend to buffer winter population fluctuations to some degree.

Mountain Goat: This species is limited primarily to rugged topography in the East and West Cabinet Mountain ranges. The habitat trend is static to possibly decreasing in the long term. Any decrease is due to continuing vegetative succession resulting from a lack of periodic wildfires or prescribed burning at higher elevations. Because primary mountain goat habitat is located at high elevations and the Forest Plan has allocated these lands to non-commodity uses, management activities (other than fire suppression) are not a major concern. Hunter harvest statistics and aerial survey data support a conclusion that goat populations have been relatively stable over the past decade with minor annual fluctuations.

Pileated Woodpecker: Personal observation by Forest biologists indicate that pileated woodpeckers are observed frequently on the Kootenai, and these informal observations provide no indication of any major population change for the species. Additional information is being collected through the R-1 Landbird Monitoring Program and through sampling special paired monitoring sites to begin assessing the effects of intermediate timber harvest on pileated woodpeckers. The landbird monitoring results for the Northern

Region, the preliminary population transects, and Forest staff observations all point to the same consistent interpretation that pileated woodpeckers are widespread and are relatively common on the Kootenai National Forest. In addition, monitoring items C-5 Old Growth Habitat, and C-6 Cavity Habitat indicate that we are on-track with providing the necessary habitat for this species. See Monitoring Item C-4 (old growth species) for more information.

Recommended Actions: The results for these indicator species generally show stable or increased sightings during the last 15 years of monitoring. Elk and whitetail deer show an increase since the last reporting period. Additional monitoring is needed to determine if this trend continues. All of the species' habitats appear to be maintaining or improving, with the possible exception of mountain goat. The information shows that the Kootenai National Forest is progressing toward providing adequate habitat for these indicator species. We will continue to explore opportunities to improve mountain goat habitat.

Based on review of this item, specific changes to Forest Plan direction are not needed at this time. However, the Forest is in the process of revising the Forest Plan. Revision efforts will review the species used as management indicators.

RANGE: Noxious Weed Infestations; Monitoring Item D-2

ACTION OR EFFECT TO BE MEASURED: Determine acreage infested with noxious weeds.

VARIABILITY, WHICH WOULD INITIATE FURTHER EVALUATION: 10% increase in number of acres infested, 10% increase in density of existing infestations or a change in the diversity of noxious weed species

Purpose: This monitoring item was established to identify the changes in noxious weed infestations on the Forest. The Forest Plan requires that this item be reported annually. The expected accuracy and reliability of the information are in the moderate to high range.

Background: The Forest Plan states that noxious weed infestations will be monitored for increases in total acreage, increases in weed density and the introduction of new weed species on the Forest. Weed infestations have been established along many roadsides, railroad and power line rights-of-way and other disturbed areas such as gravel pits. Spotted knapweed and others have started to migrate away from the road right-of-way onto undisturbed hillsides, especially within the drier vegetation types. Weeds are also becoming established in harvest units where the seeds have been brought by machinery. Most of the weeds are/were brought here attached to machinery, automobiles, railcars, etc. The Forest prepared an Herbicide Weed Control Environmental Assessment in 1997. The purpose of this EA was to provide an additional tool for eradicating new invaders and limiting the spread of existing noxious weeds.

The Kootenai Forest classifies weeds into five categories, which include all the species listed by the State of Montana and Lincoln and Sanders Counties. Table D-2-1 shows the types of weeds, and the category they are in, that occur on the Forest..

Table D-2-1 **Noxious Weeds on the Kootenai National Forest**

Category	Status	Threat	Goal	Species Included
Group Ia. *Potential Invaders*	not known to exist	high probability of causing severe economic or environmental damage	prevention, eradication	plumeless thistle (***Carduus acanthoides***), yellow starthistle (***Centaurea solstitialis***), common crupina (***Crupina vulgaris***), Dyer's woad (***Isatis tinctoria***), purple loosestrife (***Lythrum salicaria***), Eurasian milfoil (***Myriophyllum spicatum***), tamarisk (***Tamarix*** spp.)
Group Ib. *New Invaders*	small populations at limited sites	high probability of causing severe economic or environmental damage	eradication	bugloss (***Anchusa officinalis***), whitetop (***Cardaria draba***), musk thistle (***Carduus nutans***), diffuse knapweed (***Centaurea diffusa***), Russian knapweed (***Centaurea repens***), dwarf snapdragon (***Chaenorrhium minus***), rush skeletonweed (***Chondrilla juncea***), Scotch thistle (***Onopordum acanthium***), Japanese knotweed (***Polygonum cuspidatum***), tall buttercup (***Ranunculus acris)***

Group Ic. *New Invaders*	medium populations at limited sites	high probability of causing severe economic or environmental damage	containment within main body of infestation, eradication of populations	blueweed (***Echium vulgare***), leafy spurge (***Euphorbia esula***), Dalmatian toadflax (***Linaria dalmatica***), yellow toadflax (***Linaria vulgaris***), tansy ragwort (***Senecio jacobaea***)

Table D-2-1 continued

Category	Status	Threat	Goal	Species Included
Group II. *Existing Populations*	large, widespread populations	high probability of causing environmental or economic damage	prioritize areas to be treated, reduction of plant populations, reduce rate of spread	common burdock (***Arctium minus***), absinth wormwood (***Artemisia absinthium***), spotted knapweed (***Centaurea maculosa***), oxeye daisy (***Chrysanthemum leucanthemum***), Canada thistle (***Cirsium arvense***), field bindweed (***Convolvulus arvensis***), common hound's tongue (***Cynoglossum officinale***), orange hawkweed (***Hieracium aurantiacum***), meadow hawkweed (***Hieracium pratense***), common St. John's-wort (***Hypericum perforatum***), sulfur cinquefoil (***Potentilla recta***), common tansy (***Tanacetum vulgare***)
Group III. *Species of Undeter-mined Status*	variable, some new, some well established	undetermined – potential for environmental and economic damage	monitor known populations for trends	meadow knapweed (***Centaurea pratensis***), chicory (***Chicorium pratensis***), poison-hemlock (***Conium maculatum***), Scot's broom (***Cytisus scoparius***), spotted cat's-ear (***Hypochaeris radicata)***, kochia (***Kochia scoparia***), scentless chamomile (***Matricaria maritime var. agrestis***)/, germander speedwell (***Veronica chamaedrys***), common speedwell (***Veronica officinalis***)

Evaluation: All the weed species listed in Table **D-2-1** are of concern on the Kootenai National Forest. This list includes the State of Montana and Lincoln County lists as well as other weed species that the Forest has deemed important. The State of Montana and Lincoln County are very concerned about new invaders, especially two relatively new weed invaders--tansy ragwort and rush skeletonweed. There is a strong desire to keep these two species from moving east of the Continental Divide into the large farming areas of central and eastern Montana. The State has provided added monies for surveys and spraying to contain the expansion of these species and to eradicate them. Even though strong emphasis is placed on these two species, grave concern remains for all the other weed species listed. Control is not confined to these two species. Treatments for the weed species is an Integrated Pest Management approach that includes one, or a combination, of the following: **biological**--release of bioagents; **mechanical**--hand pulling, hoeing, clipping of seed heads, etc.; **chemical**--application of herbicides; and **cultural**--establishment of desirable plants as competition.

Existing weed infestations have expanded greatly over the past 25 years. The most common weed on the KNF is spotted knapweed. In 1995, county weed specialists estimated that knapweed infested over 250,000 acres across the forest (Hirsch and Leitch 1996). Two-thirds of the total infestations are in forestlands, rangelands, and/or wildlands; the remaining third are in road or railway corridors. The most widespread infestations are in the Clark Fork, Fisher River, and Kootenai River valleys. The spread of weeds has become very noticeable on winter game ranges, especially to the east of Libby. As an example, the “horse range” behind (north of) Canoe Gulch Ranger Station is estimated to have lost >80 percent of its effectiveness as winter range. Most of the encroachment has been by spotted knapweed. Spotted

knapweed is less widespread in the Tobacco Valley area because of earlier weed control programs that included the use of herbicides (1986 Noxious Weed Treatment Program Final Environmental Impact Statement allows the use of herbicides on the Rexford and Fortine Ranger Districts). KNF specialists estimate that approximately 250,000 acres are at moderate or high risk of infestation by spotted knapweed, tansy ragwort, leafy spurge, blueweed, and goatweed; one million acres are at high risk of infestation by orange and meadow hawkweeds; and 500,000 acres are at moderate or high risk of infestation by tansy ragwort. These acres were compiled by applying a modification of the process described by Mantas and Jones (2001).

Orange and meadow hawkweeds, oxeye daisy, and common St. John's wort have made significant increases in the last ten years around the Forest. The toadflaxes, absinth wormwood, and common hound's-tongue are increasing in different parts of the Forest. Blue weed has been observed in many recent harvest units in the Clark Fork Valley area.

Inventory

Four hundred twenty-nine weed surveys were completed last summer (FY 02). Table D-2-2 summarizes the percent of a weed species found within each survey. The surveys note each noxious weed species seen in the survey (from the Kootenai National Forest list of weed species) as well as the predominant infestation size and cover class, or density, of each species. Weeds listed on table D-2-1 are those currently being tracked by the Kootenai National Forest. Three types of surveys were conducted last summer. One was a road survey specifically looking for rush skeletonweed. It also noted the presence or absence of other weed species. The second survey type was an area survey confined to the upper Little Wolf Creek drainage specifically to locate tansy ragwort plants. The third type was a general survey noting weed species on roads traveled. The majority of the surveys occurred on the northeast portion of the Forest. People involved with fighting fire on other parts of the Forest prevented a more even distribution of survey location

Table D-2-2 **Percent of a Weed Species within each Survey**

Species (*Six Letter Code*)	**% of Surveys with this Species**	**Predominant Infestation Size**	**Predominant Cover Class**
Ia Potential Invaders			
Plumeless thistle (*Caraca*)			
Yellow starthistle (*Censol*)			
Common crupina (*Cruvul*)			
Dyers woad (*Isatin*)			
Purple loosestrife (*Lytsal*)			
Eurasian milfoil (*Myrspi*)			
Tamarisk (*Tamarix spp.*)			
Ib New Invaders (small populations)			
Bugloss (*Ancoff*)	*		
Whitetop (*Cardra*)	*		
Musk thistle (*Carnut*)	1	<.1	trace
Diffuse knapweed (*Cendif*)	3	<.1	trace
Russian knapweed (*Cenrep*)	*		
Dwarf snapdragon (*Chamin*)	*		
Rush skeletonweed (*Chojun*)	2	<.1	trace
Scotch thistle (*Onoaca*)	<1	.1-1 acre	.1-1
Japanese knotweed (*Polcus*)	*		
Tall buttercup (*Ranacr*)	*		
Ic New Invaders (medium populations)			
Blue weed (Viper's bugloss) (*Echvul*)	*		
Leafy spurge (*Eupesu*)	<1	.1-1	high

Dalmatian toadflax (*Lindal*)	2	<.1 acre	low to high
Yellow toadflax (*Linvul*)	2	<.1 acre	trace
Tansy ragwort (*Senjac*)	3	***	***
II Existing Infestations			
Common burdock (*Arcmin*)	*		
Absinth wormwood (*Artabs*)	2	<.1	***
Spotted knapweed (*Cenmac*)	83	****	****
Oxeye daisy (*Chrleu*)	62	****	****
Canada thistle (*Cirarv*)	74	****	****
Field bindweed (Conarv)	*		
Common hound's-tongue (Cynoff)	9	**	**
Orange hawkweed (*Hieaur*)	55	****	****
Meadow hawkweed (*Hiepra*)	36	****	****
Common St. John's-wort (*Hypper*)	52	****	****
Sulfur cinquefoil (*Potrec*)	9	<.1-1 acre	trace to low
Common tansy (*Tanvul*)	20	<.1-1 acre	trace to med
III. Species of Undetermined Status			
Meadow knapweed (*Cenpra*)	<1	<.1- 1 acre	trace to med
Chicory (*Cicint*)	*		
Bull thistle *(Cirvul)*	28	**	**
Poison-hemlock (*Conmac*)	*		
Scot's broom (*Cytsco*)	*		
Spotted cat's-ear (*Hyprad*)	<1	<.1	trace
Kochia (*Kocsco*)	*		
Scentless chamomile (*Matmar*)	*		
Germander speedwell (*Vercha*)	*		
Common speedwell (*Veroff*)	<1	<.1	trace

* = Species known to occur on the KNF, Lincoln County, and/or Sanders County but not noted on any surveys.
** = Indicates that the lower two categories of size and cover class are well represented.
*** = Indicates that the lower three categories of size and cover class are well represented.
**** = Indicates that all infestation size and cover class categories are well represented.

Table **D-2-2** information was tabulated from the three types of surveys. These surveys also indicated the typical size of infestation and the average cover class or density of plants. These surveys were conducted along both open and closed roads. Infestation sizes were noted and characterized as one of the following: <.1 acre, .1 to 1 acre, 1 to 5 acres, and > 5 acres. Cover classes (plant densities) were characterized as trace (<1%), low (1 to 5%), medium (6 to 25%), or high (>25%). The total number of noxious weed species noted in the road surveys is 23. There are an additional 20 species on the Forest weed list. Two new sites of rush skeletonweed were located. Over 600 miles of road were inventoried.

Approximately 2600 acres were surveyed and mapped for tansy ragwort. Both the size and density were noted and provided the basis for the spraying of tansy. The tansy ragwort population was originally noted only in the upper Little Wolf area on the KNF and the upper Good Creek area of the Flathead National Forest. It was hoped that it could be contained to these areas. It is now being found up to 20 air miles away. Several new sites were found again last season.

Change over time can be measured by observing changes in % of surveys with each species present, and by observing changes in the most common size and density of those populations. Table D-2-2 also shows that spotted knapweed, common St. John's-wort, meadow hawkweed, Canada thistle, orange hawkweed, common hound's-tongue, and oxeye daisy are the most common weed species present on the KNF, all having been recorded on over 30% of the surveys conducted. Canada thistle, spotted knapweed, and bull thistle are the most prevalent. Many weed species are just becoming established, such as rush skeletonweed, blue weed, chicory, kochia, Dalmatian and yellow toadflaxes, common and germander

speedwells, scentless chamomile, and tall buttercup. Common St. John's-wort, orange hawkweed, rush skeletonweed, common tansy, and oxeye daisy all appear to be more common on the west side of the Forest, whereas, absinth wormwood, meadow hawkweed, hound's-tongue, musk thistle, and tansy ragwort are more common on the east side. Whitetop, Japanese knotweed, Russian knapweed, kochia, poison-hemlock, and Scot's broom have been found on the Forest, but were not recorded in this year's surveys.

Table D-2-3 **Percent of Weed Populations in Each Infestation Size and Density by Weed Category**

Weed Category	Infestation Size				Infestation Density			
	Number and % <.1 acre	Number and % .1-1 acre	Number and % 1-5 acres	Number and % >5 acres	Number and % Trace	Number and % Low	Number and % Medium	Number and % High
Potential Invaders	0	0	0	0	0	0	0	0
New Invaders (small)	19 (76%)	5 (20%)	1 (4%)	0	18 (72%)	5 (20%)	2 (8%)	0
New Invaders (medium)	21 (88%)	3 (12%)	0	0	18 (69%)	2 (8%)	5 (19%)	1 (4%)
Existing Infestations	417 (36%)	397 (34%)	246 (21%)	102 (9%)	329 (28%)	320 (28%)	272 (23%)	241 (21%)
Undetermined Status	61 (67%)	18 (20%)	10 (11%)	2 (2%)	48 (53%)	33 (36%)	8 (9%)	2 (2%)
Overall Average	40	32	20	8	34	25	22	19

Table D-2-3 describes the average infestation size and density for each of the weed categories (New Invader, Existing Infestation, etc.) and then gives the overall average for all weeds tracked by the Forest. For this monitoring period, the overall infestation size has shifted to larger populations being found. The overall density class is fairly uniform. In taking a closer look the *New Invaders* and *Undetermined Status* categories remain about the same—the largest sizes and densities remain in the smallest sizes. However, weeds in the existing infestation category are more evenly spread throughout the size and density categories, showing that they have not remained in the smaller size classes and densities, but rather trend toward larger populations and higher densities if left unchecked.

This table was calculated by dividing the total number of recorded weed infestations in each category (size class and density class) by the total number of recorded weed infestations in that weed category. This gives a percentage of the total weeds in each category found in each size and density classes. The same was done to calculate the overall average, adding up weed infestations in all categories by their infestation sizes and densities, and dividing by the total weed infestations recorded. This table will also be valuable for displaying the changes in weed populations over time.

CONTROLS

Biological Agents

Implementation

The KNF's present weed management program is an Integrated Pest Management (IPM) approach that combines prevention, education, and biological, mechanical, cultural, and chemical control of weeds. Biological control (biocontrol) has been a primary method of weed control across much of the forest. Seventeen bioagents as well as two funguses have been released in the Kootenai National Forest/Lincoln County area. Since 1987, the KNF, in cooperation with the Western Agricultural Research Center (WARC) and other agencies and entities, has made approximately 200 releases (Table D-2-4) of biocontrol agents and funguses. Each release contains 50 to 200 insects. Most of these releases have been targeted at control of spotted knapweed, though several biocontrol agents for common St. John's-wort,

tansy ragwort, leafy spurge, Canada thistle, musk thistle, and Dalmatian and yellow toadflaxes have also been released. The releases have been made in approximately 100 different locations. Some releases have been made in the same sites to help build the populations faster in these areas. Releases of different species in the same location have also been made. More recently releases have been made from collections taken locally. In some areas populations from earlier releases have increased sufficiently to provide collectible numbers.

Table D-2-4 200 **Releases Of Biocontrol Agents And Funguses**

Year	1987	1988	1989	1990	1991	1992	1993	1994
No.	2	6	4	4	10	10	12	14
Year	1995	1996	1997	1998	1999	2000	2001	2002
No.	28	58	40	11	38	2	6	4

The banded gallfly (Urophora affinis) was released in Montana and Oregon in 1973. This bioagent attacks the seed heads of spotted knapweed. It has survived and become established to the point where it can be found throughout much of the Forest. The spotted knapweed seed head moth, UV knapweed seed head fly, lesser knapweed flower weevil, sulphur knapweed moth, and the knapweed root weevil have also been released. The former three attack the seed head, while the latter two attack the root system. Two spotted knapweed fungus have also been released. Even though the bioagents are expanding they are not having a significant impact on populations densities or population spread yet

An explosion of tansy ragwort followed the Little Wolf Fire in 1994. The fire started on the Kootenai National Forest and extended into the Flathead National Forest. Initially spraying was used to control the spread. Subsequently two bioagents (ragwort seed fly and cinnabar moth) were released. These two bioagents have proved very successful in the Flathead area, but not as successful on the Kootenai side. On the Kootenai side, the releases were two years later and the climate is slightly different. These two bioagents seem to be successful in controlling the denser portions of the populations. However, chemicals will be needed to deal with the outlying populations.

Biocontrols have advantages and disadvantages. If biocontrols become established, they will increase in number and continue to attack the target organism. These controls are generally species or species group specific. Other vegetation and resources are not harmed. However, many years are required for biocontrol populations to become large enough to impact the host weed. Other insects and animals may also prey upon Biocontrols. Some biocontrols may be limited by climatic and environmental conditions (rainfall, cold, shade etc.). Biocontrols usually do not eradicate the host weed completely and are often required in very large numbers to significantly affect the host. Thus, biocontrols are best used on existing, widespread weed infestations and not on new invader species for which the goal is eradication (Herbicide Weed Control EA 1997).

Effectiveness:

In general, the effect of the releases has been minimal thus far, although the bioagent populations have been building and the increase in weeds has slowed in some areas. Biocontrol has not measurably reduced populations of knapweed, common St. John's-wort, Canada thistle, or toadflax on the KNF, probably because populations of the biocontrol agents are still very small relative to the size of the weed infestations. There is observational evidence that seedhead flies have slowed the rate of knapweed spread and, with continued releases and reproduction, these and other biocontrol insects may, over time, begin to reduce existing weed populations. However, it is unlikely that biocontrol agents will cause any widespread reduction of spotted knapweed for at least 10 years, during which time spotted knapweed, St.

John's-wort, toadflax, and other existing infestations will continue spreading (Herbicide Weed Control EA 1997).

Various spot checks have shown that larvae of the released bioagents can readily be found. Last summer the Northern Region office of Cooperative Forestry and Forest Health Protection (CFFHP) department monitored the survival of *Agapeta zoegana* and *Cyphocleonus achates* releases. Of the 15-bioagent release sites checked all had larvae and/or adults of the bioagents present. A determination was made that at least four of the sites have populations sufficient to use as insectaries (a population large enough to collect insects for transfer to other sites). Using bioagents from a local insectary is preferred, since these insects have adapted the best to conditions of the local area.

Biological control agents do not effectively control new infestations because populations are generally small and scattered or because effective biocontrol agents have not been found (Herbicide Weed Control EA 1997). Biological controls are best used to decrease the density or vigor of established noxious weed infestations, but are generally not effective at stopping the spread of new invaders.

Herbicide Application

Implementation:

In the six years since the Herbicide Weed Control Environmental Assessment (EA 1997) has been published, more than 13,000 acres of weeds have been sprayed. The main target species have been spotted knapweed, rush skeletonweed, tansy ragwort, leafy spurge, absinth wormwood, Canadian thistle, orange hawkweed, yellow hawkweed, Dalmatian toadflax, yellow toadflax, oxeye daisy, sulfur cinquefoil and common St. John's-wort. Other species that have been sprayed are common tansy, Russian knapweed, diffuse knapweed, Scot's broom, Scotch thistle and blueweed.

The KNF has added four new chemicals that will allow more options in the treatment of weed populations on the Forest. The chemicals are Metsulfuron (trade name-Escort), Imazapic (trade name-Plateau), Sulfometuron (trade name-Oust), and Triclopyr (trade name-Garlon 3A).

Effectiveness:

No specific plots were established to monitor the effectiveness of herbicide applications, although monitoring of the rush skeletonweed populations by the county has shown that Tordon 22K is effective against this species. Follow-up spraying of individual plants that were not sprayed because they were missed earlier, or germinated later in the year has been found to be a key element in the control of this species. Monitoring effectiveness of herbicide applications is in the form of photo points within treated areas before and after treatments and will continue for 10 years after treatment.

The KNF has used herbicides to control noxious weeds with success. The 1986 Noxious Weed Treatment Program Final Environmental Impact Statement allowed the use of herbicides on the Rexford and Fortine Ranger Districts. Spraying of roadsides, administrative sites, and gravel pits on these districts has visibly reduced weed populations in many areas and prevented weeds from spreading to uninfested areas. Except for emergency spraying at the Troy and Libby Airports after the 1994 fires and for rush skeletonweed spraying starting in 1993, the KNF has only been spraying on a larger scale since 1997. Lincoln, Sanders, and Flathead Counties have sprayed roadsides, which cross NFS lands where the county has clear rights-of-way since the early 1990's. The KNF completed an Herbicide Weed Control Environmental Assessment in 1997. The purpose of this EA was to provide an additional tool for eradicating new invaders and limiting the spread of existing noxious weeds.

In 1996 a Noxious Weed Control Provision was added to timber sale contracts and well as in plans for ground disturbing activities. This provision requires machinery to be washed before operating on National Forest land. Inclusion of this provision is a result of monitoring efforts that have identified noxious weeds

at some machinery operation sites. Another effective measure used on the Forest is spaying weeds along roadsides prior to timber harvest operations and/or ground disturbing activities. These actions are occurring under the direction of the Forest Plan and have been shown to be effective in reducing the spread of noxious weeds.

Mechanical and Cultural

Implementation:

Seed heads of tansy ragwort were clipped along several hundred yards of roadway. Areas of Dalmatian toadflax were hand pulled. These plants and plant parts were then burned.

Effectiveness:

The KNF's mechanical and cultural control efforts have not proven effective at containing or reducing widespread noxious weed infestations. Some forms of mechanical and cultural control, such as tilling and mulching, have not been tried because they are not practical on the steep, forested hillsides, which comprise much of the Forest. Roadside mowing has not prevented knapweed from flowering and going to seed. Roadside clipping of tansy ragwort seed heads was used this year in conjunction with spraying.

Hand pulling, which is the principal method of mechanical control used on the KNF, has been effective on individual plants of some species or very small, isolated weed populations. Attempts to hand-pull large infestations of knapweed and toadflax have provided only temporary control because seeds remain viable in the soil for up to 12 years. Hand pulling is completely ineffective on weeds with deep taproots and weeds, which reproduce through runners or shoots, such as rush skeletonweed and leafy spurge. Pulling these species stimulates growth in the roots and fragments, which remain in the soil, resulting in more plants instead of less (Herbicide Weed Control EA 1997).

Most soil-disturbing activities on the KNF require reseeding of exposed soil. Though reseeding is done principally to prevent erosion, it does inhibit invasion of disturbed sites by noxious weeds. The KNF requires seed to be certified "noxious weed free". In addition, the KNF has established a native seed bank to assist in restoring disturbed sites. Reseeding and revegetation has prevented weeds from spreading onto many disturbed sites. However, these practices have not prevented existing infestations from spreading into wildlands and forests and also have not reduced existing infestations. In 1996 a clause, Noxious Weed Control Provision C(T) 6.26, was added to timber sale contracts. This is a mandatory provision that applies to all new sales and will be included when sales are modified or extended. The clause requires off-road equipment such as tractors, skidders, and processors to be washed prior to operating. This clause will help prevent bringing in new weeds to disturbed sites.

NEW INVADERS

All weeds are a focus for The Kootenai National Forest, State of Montana, and Lincoln and Sanders Counties. But new invaders are of special interest since they are generally confined to one area or part of the state. Tansy ragwort and rush skeletonweed are two such species. The Montana Department of Agriculture is working strenuously to keep these two species west of the Continental Divide. Rush skeletonweed has been a priority since its discovery in Lincoln and Sanders Counties in the early nineties. There has been an eradication program in existence for Lincoln and Sanders Counties and the Kootenai National Forest since. The populations located along roads are flagged, then sprayed and the seed heads clipped. The plants are removed and/or sprayed. Every site that has been known to have rush skeletonweed is visited several times each year. The known populations have been decreasing but not disappearing.

Tansy ragwort exploded after the Little Wolf Fire in 1994. Since the fire covered many ownerships and tansy is located on these same ownerships, a cooperative program between the State of Montana Lands Division, Plum Creek Timber Company, Bonneville Power Administration, Lincoln County, Flathead

County, Kootenai National Forest, Flathead National Forest, US Fish and Wildlife Service, Montana Department of Agriculture, and private land owners has been working to contain tansy in the Little Wolf vicinity. Through an Integrated Pest Management program of biological, mechanical, cultural, and chemical factors these entities are working very hard to contain tansy. The Montana State Department of Agriculture provides grant money to help control tansy and help keep it isolated in northwest Montana.

Other than some new isolated sites located approximately 20 air miles to the northeast the tansy has remained in the Little Wolf/Island Lake area. The main strategy has been to eliminate new populations located away from the main population and contain the main population. This means that spraying has been used for the outlying populations and bioagents releases for the main population. This strategy of bioagent releases in the center of the infestation, spraying of the perimeter populations and clipping adjacent to water bodies has been very successful in containing tansy ragwort. Tansy ragwort was observed following the Elk Mtn. Fire in 2000. This area is approximately 12 air miles north of the Little Wolf Fire area. The same eradication techniques applied in the Little Wolf area are being applied in the Elk Mtn. area.

Conclusion: Monitoring indicates that several noxious weeds (see Table D-2-2) have increased more than 10% in the numbers of acres affected and some have had a 10% or more increase in density of existing infestation, since the Forest Plan (1987) was first signed. In addition, with the discovery of several new invaders over the last several years, it is apparent that the diversity of noxious weed species has increased. Based on this, this monitoring item is outside the range prescribed in the Forest Plan.

Recommended Actions: Prior to 1997 emphasis in weed control focused on the use of biological and cultural controls (cultural control uses plant competition to maintain or enhance desired plants) on the southern part of the Forest and the use of herbicides and biological and cultural controls on the north end of the Forest. In 1996, a Noxious Weed Control Provision was added to the timber sale contracts. In 1997, the Herbicide Weed Control EA was issued giving the Forest the ability to use a more integrated approach to controlling weeds. At this time the Forest is considering the need to conduct an analysis and subsequent decision to evaluate the treatment of more acres than currently authorized, with new and aggressive herbicides and the feasibility of aerial spraying. Additionally, the need to emphasize and prioritize noxious weed management has been identified as a concern for Forest Plan revision

BIBLIOGRAPHY

Hirsch, S.A., and J.A. Leitch. 1996. ***The Impact of Knapweed on Montana Economy***. Agricultural Economic Report No. 355.., Dept. of Agri. Econ., Agri. Exp. Sta., North Dakota State Univ., Fargo, ND.

Hitchcock, C.L., and L. Cronquist. 1973. ***Flora of the Pacific Northwest***. 8th Printing 1991. Illustrations by Jeanne R. Janish. Univ. of Wash. Press, Seattle and London. 730 pp.

Kootenai National Forest. 2002. ***Noxious Weed Handbook***. Edition 4.0. 110 pp.

Mantas, Maria, and Jeff Jones. 2001. ***Evaluating Risk to Native Plant Communities from Invasion of Selected Exotic Plant Species***. A Proposal for the Western Montana Planning Zone. Flathead National Forest. 20pp.

USDA Agri. Res. Ser. and MT Dept. of Agri. Montana State Univ. 1996. ***Biological Control of Weeds in the West***. ed. by Norman Rees et al. Western Society of Weed Science. Bozeman, MT.

USDA Forest Service. Northern Region. 1996. ***Noxious Weed Treatment Program***. Final Environmental Impact Statement, Kootenai National Forest, Libby, MT. 72 pp.

USDA Forest Service, Northern Region. 1987. ***Kootenai National Forest Plan - Final Environmental Impact Statement***, Vol. 2. 405 pp.

USDA Forest Service, Northern Region. 1987. ***Kootenai National Forest - Land and Resource Management Plan***, Vol. 1 201 pp.

USDA Forest Service, Northern Region. 1987. ***Kootenai National Forest - Record of Decision***. 44 pp.

USDA Forest Service, Northern Region. 1997. ***Herbicide Weed Control, Environmental Assessment***. Kootenai National Forest, Libby, MT. 50 pp plus appendices.

USDA Forest Service, Northern Region. 2002. ***Supplemental Informatikon Report for the 1997 Herbicide Weed Control Environmental Assessment and Decision Notice***. Kootenai National Forest

Whitson, Tom D. (editor), Larry C. Burrill, Steven A. Dewey, David W. Cudney, B.E. Nelson, Richard D. Lee, and Robert Parker. 1996. ***Weeds of the West***. Published by the Western Society of Weed Science. University of Wyoming. Pioneer of Jackson Hole Jackson, Wyoming. 630 pp.

TIMBER: Allowable Sale Quantity (ASQ); Monitoring Item E-1

ACTION OR EFFECT TO BE MEASURED:	Determine if the sell volume meets the projections of the Forest Plan, including other permissible sale volumes.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 5 percent deviation for the ASQ volume, and +/- 10 percent deviation for the other permissible volumes.

Purpose: This monitoring item was established to help ensure that the ASQ stated in the Forest Plan is not exceeded and, if the ASQ is not attained, why. The Plan requires that this item be reported annually. The expected accuracy and reliability of the information are both high.

Background: The ASQ is a projected maximum or ceiling and not a target to be reached at the expense of other considerations. The Forest's projected total maximum timber **sell** volume for the decade from suitable management areas is 2,270 million board feet (MMBF), which is an average of 227 MMBF per year (see Forest Plan, Appendix 11). In addition, 60 MMBF was estimated to be sold from unsuitable management areas, averaging six MMBF per year. These two components of suitable and unsuitable sell volumes comprise the total potential timber sale program of 2.3 billion board feet for the decade, which is an average of 233 MMBF per year.

In November 1995, the Chief of the Forest Service issued a decision on a Forest Plan appeal related to a technical error in the calculation of the Forest's ASQ. The issue centered on how timber age classes were cataloged in the inventory information used to calculate ASQ. A description of the problem is in the FY92 Monitoring Report. The decision required that the Forest is not to exceed a sell volume of 150 MMBF per year until the Plan is either amended or revised.

Results: Table E-1-1 shows that sell volumes have declined from approximately 200 MMBF per year in FY 88 to approximately 63 MMBF per year in FY02. For the past fifteen years, the average yearly amount sold has been 99.3 MMBF from suitable lands, and 1.7 MMBF from unsuitable lands. In total, this amounts to 101 MMBF average per year. The average for 1998-2002, the third five-year period, was 60.9 MMBF/year. This actual sell volume is well below the ASQ limit as set in the Plan.

Evaluation: After fifteen years of implementation, the trend of decreasing sell volume is continuing. In the FY92 and FY97 Monitoring Reports, the Forest reported in detail on a number of factors that caused this decrease. Most of these factors are still influencing the sell volume. The first five years of implementation, sell volume was relatively high, averaging 161 MMBF/year (see the FY92 Monitoring Report). During the second five years of implementation, sell volume averaged about 81 MMBF/year.

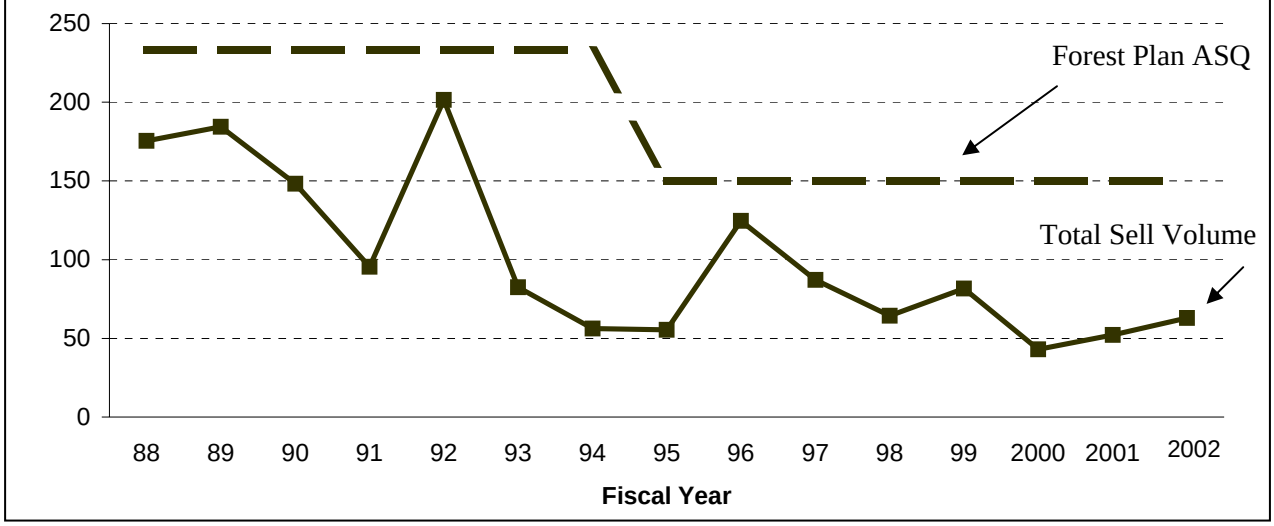
Many factors have influenced the timber sales program. The USFWS amended the biological opinions for grizzly bear recovery in July 1995 and changed how recovery processes would take place on the Forest. The Inland Native Fish (INFS) Decision of July 1995 resulted in additional streamside protection measures. In general, it has become more difficult to plan and execute sales due to public concerns over resource values and scheduling requirements necessary to meet resource needs.

The evaluation limit for this monitoring item is plus or minus 5 percent for suitable volumes and plus or minus 10 percent for unsuitable volumes. These limits have been exceeded, and this indicates that evaluation of these factors, which started in the FY92 Monitoring Report, will need to continue during the revision of the Forest Plan.

Table E-1-1 **Timber Sell Volume (MMBF) by Category by Fiscal Year**

	Forest Plan Annual ASQ Projection	Average Sell Volume FY 88-92	Average Sell Volume FY 93-97	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	Average Sell Volume FY 98 - 2002	Average Sell Volume FY 88 - 2002
Suitable Lands	227	159	81	61.6	79.8	41.1	49.3	60.7	58.5	99.3
Unsuitable Lands	6	2	0.4	2.8	1.9	2.0	2.9	2.3	2.4	1.7
Total Timber Sell Program	233	161	81.4	64.4	81.7	43.1	52.2	62.9	60.9	101

Figure E-1-1 **Total Timber Sell Volume Compared to ASQ**



Recommended Actions: The Forest has not exceeded the ASQ in 14 years of implementation. However, large changes in the actual program levels versus the projections of the Forest Plan indicate that revision of the Plan will need to address the sustainability of the timber sale program.

TIMBER: Suitable Timber Management Area (MA) Changes; Monitoring Item E-3

ACTION OR EFFECT TO BE MEASURED:	Determine if significant cumulative changes are occurring in the suitable timber base by tracking management area boundary changes.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 5,000 acre cumulative total change in any suitable timber management area.

Purpose: This monitoring item was established to help ensure that the suitable timber base was being validated before any projects were authorized and to determine what influence any significant changes have on the ASQ. The Forest Plan requires that this item be reported annually. The expected accuracy and reliability of the information are both high.

Background: The allowable sale quantity (ASQ) calculated for the Plan is partially dependent on the amount of suitable timber acreage. This acreage is located within MAs 11, 12, and 14-17. These MAs are validated during site-specific project analysis. When inaccuracies are found, an MA boundary correction is made to keep the Forest Plan MA Map and acreage current. MA boundary changes can result in gains or losses in MA acreage, depending on the conditions found. The important items to track are the total changes by MA and the net gains or losses in suitable timber acreage. The most common conditions that cause an MA map change are mapping and drafting errors found on the original maps, non-productive forest land located within an MA mapped as productive (the reverse situation is also found), big-game winter range habitat is non-existent where originally mapped (the reverse is also found), or additional acreage is designated to meet the 10 percent minimum old growth standard. Differences in calculating acreages also occurred in FY95-96 when the Management Areas were converted from hand-drafted maps to GIS electronic files.

Evaluation: Table E-3-1 displays the net MA acreage changes in suitable timberland for the last fifteen years (FY 88-02) and the net change in all suitable timberland. Acreage losses occurred in MA 11, 12, 14, 15 and 16; while MA 17 gained 1 acre in FY02. Total net loss in the suitable timberland in FY02 was 2,167 acres. Table E-3-2 shows this information for the largest unsuitable MAs. Most of these MA changes were made in the process of designating MA 13 and other old growth management areas. The pattern of change has been fairly consistent in both magnitude and direction. This monitoring item is outside the prescribed range for MAs 11, 15 and 16 (more than 5,000 acres of change). The remaining suitable timber MAs are within evaluation limits (MAs 12, 14, 17).

Recommended Actions: The degree to which changes have been made to management area designations indicates a continuing validation of Forest Plan data. The large change in the suitable management area category (over 60,000 acres) amounts to approximately three percent of the total suitable base. During revision of the Forest Plan, sustainability and ASQ calculations will be made using updated information.

Table E-3-1 **Net Acreage Changes by Management Areas (MA) in Suitable Timberland**

Fiscal Year	MA 11	MA 12	MA 14	MA 15	MA 16	MA 17	Total Chg to Suitable MAs
1988	330	0	1,070	(1,760)	(510)	0	(870)
1989	(1,142)	(345)	386	253	(22)	(48)	(918)
1990	(164)	(420)	(130)	(4,273)	916	(661)	(4,732)
1991	78	(442)	(1,050)	(3,188)	(1,414)	(281)	(6,297)
1992	(9,279)	(3,178)	(196)	(1,711)	(1,498)	(323)	(16,185)
1993	(1,329)	1,000	(705)	(7,444)	(2,271)	22	(10,727)
1994	(109)	(402)	106	524	111	(148)	82
1995	(457)	1,441	131	(1,845)	(193)	0	(923)
1996	(1,370)	2,743	(206)	(1,679)	229	440	157
97CLE*	(127)	(2,030)	2,392	(8,680)	(2,689)	(494)	(11,628)
97 other	(2,215)	2,168	(66)	(5,055)	(625)	366	(5,427)
1998	(827)	(1,075)	(1,432)	90	75	(60)	(3,229)
1999	316	1,434	(648)	(1,281)	(1,801)	(1,168)	(3,148)
2000	754	(894)	(434)	404	(307)	(425)	(902)
2001	(283)	93	(49)	148	144	(71)	(18)
2002	(307)	(1086)	(685)	(57)	(33)	1	(2,167)
Total Net Chg to MA	(16,131)	(993)	(1,516)	(35,554)	(9,888)	(2,850)	(64,765)

Suitable MAs indicate productive forest lands with consideration for other resources determining the difference among them. MA 15 lands are managed primarily for high timber yields. MA 11 and 12 are lands which can provide for timber and big game habitat (11 for winter range and 12 for summer range). MA 14 areas are timberlands which have been identified as essential for recovery of the grizzly bear. MA 16 and 17 indicate areas where protection of the visual resource is important. * The Checkerboard Land Exchange is shown as a separate breakout in FY97.

Table E-3-2 **Net Acreage Changes by Management Areas (MA) in Unsuitable Timberland**

Fiscal Year	MA 2	MA 10	MA 13	MA 18	MA 19	MA 24	Total chg to Unsuitable MAs
1988	240	1,670	(500)	190	(280)	480	1,800
1989	842	0	(149)	32	135	100	960
1990	150	1,080	1,877	381	(950)	2,564	5,102
1991	1,009	574	4,135	(140)	(231)	1,724	7,071
1992	196	3,211	7,980	2,656	231	823	15,097
1993	(338)	374	7,931	(595)	(2,115)	2,618	7,875
1994	(173)	(69)	914	(437)	(294)	177	118
1995	181	(643)	1,788	(657)	112	(128)	653
1996	32	(550)	3,290	(1,725)	(630)	(649)	(232)
97 CLE*	12,777	(149)	(2,249)	(417)	(464)	(1,581)	7,917
97 other	109	(550)	8,501	(1,625)	(644)	(165)	5,626
1998	37	(170)	2,797	(56)	(108)	(113)	2,387
1999	(131)	366	3587	(145)	(343)	(331)	3,003
2000	28	307	1,282	347	10	(49)	1,925
2001	6	(49)	(420)	(34)	26	(7)	(478)
2002	4	213	1,684	(12)	(1)	(7)	1,181
Total Net chg to MA	14,969	5,615	42,448	(2,237)	(5,546)	5,456	60,705

Unsuitable MAs are used for areas where timber production is not a primary consideration; for example, MA 2 is Roadless Recreation; MA 10 is big game winter range not suited for timber production; MA 13 is protected old growth habitat; MA 18, 19, and 24 are lands with little timber value or lands difficult to regenerate (rocky areas, steep slopes). Other unsuitable MAs identify Wilderness, Special Interest Areas, Administrative Sites, etc. Included within unsuitable MAs are areas of inventoried old growth not identified as MA 13. NOTE: The differences displayed in the Fiscal Year totals and the Total MA Changes in the two tables shown above are the result of eight additional MAs which contain some minor changes plus the lands that have been acquired and disposed of in the land exchanges completed during the years since the Forest Plan was approved. In FY95 and FY96, there were also changes to all MAs due to the process of converting to GIS.

SOIL AND WATER: Soil Productivity; Monitoring Item F-4

ACTION OR EFFECT TO BE MEASURED:	Determine the changes in site quality due to surface displacement and soil compaction.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	A 15 percent decrease in site productivity.

Purpose: This monitoring item was established to help ensure that the basic soil resource is not compromised in the production of other resources such as timber harvesting, grazing, etc. The Plan requires this item to be reported every five years. The expected accuracy and reliability of the information are moderate.

Background: Soil resource management has the goal of maintaining or improving long-term soil productivity and soil hydrologic function. Soils can be physically damaged by displacement, compaction, and puddling from the wheels of vehicles, the hooves of cattle, the weight of a dragged log, the equipment dragging the log, etc. These factors result in the reduction of pore space, which reduces the ability of water to move into and through the soil. The soil is especially vulnerable during wet weather and wet soil conditions. Pore space reduction means more overland flow that can result in surface erosion and/or mass soil movement. The soil can also be physically and chemically damaged by heat during any intense burning, such as from wildfires, broadcast burning during site preparation, or by the burning of mechanically-bunched slash piles. Soils that are damaged from all the above conditions incur adverse affects on their hydrologic function and/or sustain actual losses in soil productivity.

Region One has a policy that allows up to 15 percent detrimental disturbance (FSH 2509.18, 5/1/94; updated 1999 FSM 2500 – Watershed and Air Management, R-1 Supplement No. 2500-99-1, Chap 2550 – Soil Management). The Kootenai Forest uses the 15 percent detrimental disturbance as a measure to track the impact on site productivity. If more than 15 percent of an area is significantly disturbed, then we can say that it has probably incurred a decrease in long-term site productivity.

Field monitoring is done within activity areas using **line transect** and **walk-through** methods (patterned after Howes et al. 1983). The *line transect* is performed perpendicular to the direction of the ground-disturbing activity. It involves from one to five transects within each activity area. Each step along the transect represents a monitoring point. Both quantitative and qualitative descriptions are provided. The *walk-through* method involves walking through the unit and providing a qualitative description of the soil impacts. Each transect represents the various activities that occurred within that portion of the activity area. The monitoring is representative of the variety of timber harvesting techniques that occur on the Kootenai NF. The activities represented are skyline/cable logging, forwarder logging, tractor logging (rubber tired skidders and tracked vehicles) and horse logging. Both summer and winter operational periods are included in the ground-based activities. Fuel reduction/site preparation activities have occurred in some of the units.

Results: Table F-4-4 summarizes the amount and type of harvest monitoring completed. Surveys have been completed on 376 (160 transects and 216 walk-throughs) timber harvest units scattered across the forest between 1988 and 2002. These units represent current logging methods and the types of equipment being used for mechanical falling, skidding, yarding, and slash piling. The areas ranged in size from two to 207 acres.

The 1992 report showed that 49 percent of the 501 transected-acres surveyed to that point were above the Forest Plan variability limits of 15 percent detrimental disturbance. Since then, 11,945 acres have been surveyed and less than 1/10 percent (29 acres) were above the Forest Plan limits. Table **F-4-1** displays the types of timber sales monitored from 1988-2002. Table **F-4-2** displays the number of units by harvest types monitored from 1988-2002. Areas where cable logging methods were used show little or no detrimental disturbance. The use of forwarders and winter logging, also, result in very low to low detrimental disturbance. Areas where tractors were used resulted in a higher level of detrimental disturbance, however, these areas were still within the desired levels. In general, the amount of heavily disturbed area increased directly with the number of machinery operations, the amount of area impacted, and/or the amount of moisture in the soil.

Table F-4-1 **Types of Timber Sales Monitored**

Sale Types	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**00**	**01**	**02**
Regular	2	2	1	3	10	9	3	7	8	5	12	4	3	3	20
Pest Control	2	3	1	2	4	3	0	0	8	7	7	14	2	1	2
Fire Salvage	0	5	10	9	0	4	0	0	4	11	3	0	0	0	1

Table F-4-2 **Number of Units by Harvest Type**

Sale Types	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**00**	**01**	**02**
Regular	5	6	1	7	17	19	6	15	13	9	20	7	4	7	47
Pest Control	5	5	1	2	9	5	0	0	15	14	14	25	2	2	2
Fire Salvage	0	9	19	16	0	10	0	0	11	21	4	0	0	0	1

Evaluation:

1988-1992 Results: A total of 102 units (20 transects and 82 walk-throughs) were monitored during this time period. Only walk-through monitoring occurred during the first four years of this five-year period. The 1992 Monitoring Report indicated that 49 percent of the line-transected surveyed acres, to that point, were beyond the Forest Plan variability limits. Twenty units on 10 sales were monitored. Eight units comprised of 245 acres contained more than 15 percent detrimental compaction. They ranged from 19 to 27 percent. The influence of past activities was observed in one of the units. Unit One of the Good Creek P.C. Sale only had 10 percent detrimental impact from the current activities. As the result, though, of activity in the early sixties another nine percent occurred at that time. Since the previous activity built excavated trails horizontally across the terrain and the current activities were generally accomplished vertically on the landscape, the combination of the two activity periods created 19 percent detrimental impact.

Some of the reasons for the activity areas beyond the Forest Plan variability limit of 15 percent detrimental disturbance were: the inclusion of small areas of steep terrain within areas of more gentle terrain which resulted in improper equipment being used on steep topography, some operations where dozer piling was still required in the contract, and level of experience of the sale administrator(s) and/or logging operator(s).

1993-1997 Results: One hundred thirty-eight units within 69 sales were monitored during this five-year period. Sixty-six units were line transects and 72 were walk-throughs. Of the 66 units, only 21 acres (one percent of measured acres) (one and one half units) were beyond the Forest Plan variability limits. The 66 units contained a total of 2022 acres. This very major reduction in acreage over the 15 percent level is mainly a result of far fewer acres that were "dozer piled". Other reasons include more winter logging, more broadcast burning, and more use of forwarder logging equipment. During this same period walk-throughs were conducted on 72 units containing a total of 2,656 acres. The line transects represent approximately seven percent of the total harvested acres, while the walk-throughs represent about nine percent. The total of 2,499 acres surveyed from 1992-1997 represent about seven percent of the annual harvest acres. If the areas measured are representative of the entire Forest, about 11 percent of logging and site preparation activities may be beyond the variability limit of the Forest Plan. This number, however, is very misleading since only one percent of the harvest activities during the 1993-1997 period are detrimentally impactive.

1998-2002 Results: One hundred thirty-six units within 72 sales were monitored during this five-year period. Of the 74 line-transected units (2,417 acres) none were determined to be beyond the 15 percent detrimental disturbance level. During this same period walk-throughs were conducted on 62 units containing a total of 2,314 acres. The walk-throughs and line transects represent approximately 11 percent of the harvested acres. One thing noted in the year 2002 was the increase in the “6-10” and “11-15” categories (**Tables F-4-3a and F-4-3b**). Part of the explanation was the number of units (11) that contained past activities.

Table F-4-3a **Units by Soil Disturbance Category (Line Transect)**

Disturbance Categories in Percent	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**00**	**01**	**02**
< 6	0	0	0	0	0	5	3	8	12	17	17	10	0	1	6
6-10	0	0	0	0	6	4	0	1	6	5	9	4	0	2	14
11-15	0	0	0	0	6	5	.5	0	0	0	0	3	0	0	8
15 +	0	0	0	0	8	1	.5	0	0	0	0	0	0	0	0
Totals	0	0	0	0	20	15	4	9	18	22	26	17	0	3	28

Table F-4-3b **Acres by Detrimental Soil Disturbance Category (Line Transect)**

Disturbance Categories in Percent	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**00**	**01**	**02**
< 6	0	0	0	0	0	170	32	160	377	637	558	170	0	38	80
6-10	0	0	0	0	134	68	0	29	230	129	259	147	0	246	688
11-15	0	0	0	0	122	131	14	0	0	0	0	58	0	0	173
15 +	0	0	0	0	245	8	13	0	0	0	0	0	0	0	0
Totals	0	0	0	0	501	377	59	189	607	766	817	375	0	284	941

Recommendations:
Based on the information stated above (the improvement that has occurred since 1992 and the fact that no unit was greater than 15 percent in the last eight monitoring seasons, also seen in Table **F-4-3b**), this monitoring item is determined to be within the recommended range stated in the Forest Plan (no acres should measure more than 15 percent of detrimental disturbance).

Ideally, the soil quality standards that would be used for measuring soil damage would be soil structure and soil productivity. Because these soil qualities are difficult to measure, other soil qualities are substituted. These surrogates are soil compaction, rutting, soil displacement, surface erosion, severely-burned soil, and soil mass movement.

Table F-4-4 **Kootenai NF Soil Monitoring Summary**

Year	**Total No. of Sales**	**Total No. of Units**	**Total Acres**	**No. of Tran-sected Sales**	**No. of Tran-sected Units**	**No. of Transects**	**No. of Moni-toring Points**	**No. of Walk-through Sales**	**No of Walk-through Units**
1988	4	10	316	0	0	0	0	4	10
1989	10	20	533	0	0	0	0	10	20
1990	12	21	718	0	0	0	0	12	21
1991	14	25	833	0	0	0	0	14	25
1992	14	26	637	10	20	68	6800	4	6
1993	16	34	935	6	14	31	7407	10	20
1994	3	6	115	2	4	8	1963	1	2
1995	7	15	343	4	9	18	4394	3	6
1996	20	39	1609	9	17	40	14004	11	22
1997	23	44	1676	13	22	47	15819	10	22
1998	22	38	1574	14	26	62	20520	8	12
1999	18	32	657	11	17	33	6918	7	15
2000	5	6	337	0	0	0	0	5	6
2001	4	9	520	1	3	12	4706	3	6
2002	23	51	1643	13	28	77	21037	10	23
Totals	**195**	**376**	**12446**	**83**	**160**	**396**	**103,568**	**112**	**216**

FACILITIES: Road Access Management; Monitoring Item L-1

ACTION OR EFFECT TO BE MEASURED:	Determine if the road access management objectives are being met.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 20% of the proportion of open to closed roads, as described in the Forest Plan, by the end of the first decade.

Purpose: This monitoring item was established to ensure that the road access restrictions required in the Forest Plan were being achieved. The Plan requires that this item be reported every five years. The expected accuracy and reliability of the information are high.

Background: Just prior to the time the Plan was approved in September, 1987, about 27 percent of the Forest system roads were being restricted either yearlong or seasonally (Forest Plan FEIS, page IV-51). The Plan projected that in order to provide the issue resolution desired, about 57 percent of the roads would eventually need some form of restriction. This would amount to approximately double the amount of road restrictions at the time the Plan was approved. The assumption was that the number of new roads needed to harvest timber would increase significantly, and that they would all be restricted after the timber sales were completed -- the net result being an increase in the number of miles of road with restrictions while the number of miles of unrestricted roads would remain the same. The need for additional road restrictions was to protect dispersed recreation values, provide for wildlife security in big game winter and summer range, reduce road maintenance costs, and provide for grizzly bear recovery. Because of the significant increase in the amount of road restrictions needed (from 27 percent to 57 percent), it was assumed that it would take about 10 years to accomplish. This is about an 11 percent increase each year to reach the planned level.

Evaluation: By FY 97, the objective of having restrictions on approximately 57 percent of the Forest's roads (Forest Plan p. II-10) was achieved. By 2002, the percentage of existing roads in either yearlong or seasonally restricted status has reached 63 percent. Table L-1-1 shows the progression in 5-year increments. The roads in restricted status are both yearlong and seasonal restrictions.

The percentage of roads in restricted status is 6 percent greater than estimated, and the total amount of unrestricted road access is 1,596 miles less than was estimated in the 1987 Forest Plan. This is partly a result of the fact that new road construction was less than anticipated due to reductions in the timber sale program. Road restrictions have been placed on previously existing unrestricted roads (which were not anticipated for a significant level of restrictions in the Forest Plan) and on newly constructed roads. The reasons for these unanticipated restrictions include additional wildlife habitat security measures and restrictions to decrease potential sedimentation and to improve hydrological conditions. Table L-1-1 shows the total miles of road increasing by 494 miles over the last 5 years (a 7 percent increase). Only 13.8 miles are from actual new road construction. The balance results from a more thorough accounting of previously uninventoried roads.

Recommended Actions: Continue to monitor the mileage of roads restricted and the reasons for the restrictions. Address Access as a Revision Topic in the Forest Plan Revision process.

Table L-1-1 **Forest Roads Access Restrictions**

FY	Total Miles of Road	Total Miles of Restricted Access*	% of Total Roads Restricted	Total Miles of Unrestricted Access	Difference in Miles of Unrestricted Access from FY 87
87	6,200	1,669	27%	4,530	0
92	7,149	3,784	53%	3,365	(1,165)
97	7,460	4,275	57%	3,185	(1,345)
02	7,954	4,982	63%	2,934	(1,596)

*Forest system roads only, that are restricted to motor vehicles both yearlong and seasonally.

FACILITIES: Road Density; Monitoring Item L-2

ACTION OR EFFECT TO BE MEASURED:	Determine if the road densities predicted in the Plan are still valid.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Any increase in road density over that predicted in the Forest Plan.

Purpose: This monitoring item was established because there was a strong public concern that existing and planned road miles were too numerous and that the cost to other resources (soil, water, wildlife, roadless recreation and economics) was too high. The Forest Plan requires that this item be reported every five years. The expected accuracy and reliability of the information are high.

Background: The monitoring item was designed to test the assumption of road density used in the FORPLAN computer model. This model calculated the total road mileage needed to access all the suitable timberland. The maximum road densities projected in FORPLAN ranged from 4.4 to 5.8 miles per square mile depending on the steepness of the terrain and the logging system used. These road densities were calculated from previous experience on the Forest during the 1970s. Also, a Forest Goal was established to minimize the number of roads needed to manage the Forest (see Forest Plan, page II-1). As a result, it was anticipated that actual road densities would be less than or equal to the projected maximum.

Results: During the first 5 years of Forest Plan monitoring, the only way to measure road density was based on measurements made by Ranger Districts during project planning. This method is inherently incomplete, since only a small part of the Forest is sampled. In the FY 92 Monitoring Report, the road density for suitable lands was estimated to be 3.2 miles of road per square mile. During the next 10 years of Plan monitoring, the roads and management area information for the Forest's geographic information system was completed, and it became possible to obtain an actual measurement of road density rather than a sample. In FY 97 the calculation for road density on suitable timberlands was 3.53 miles per square mile. As of FY 2002, this calculation showed that the road density for suitable lands is 3.34 miles per square mile.

Evaluation: The actual road density on suitable timberlands has been measured to be 3.34 miles per square mile, which is less than the maximum road density projected in the FORPLAN model. Given the decreased harvest levels of the Forest's current program in comparison to its program of 10 years ago, it is unlikely that there will be any significant increase in road density in the near term. In January of 2001 a new Roads Policy was issued that,'… instead of focusing on new road construction, emphasis will be given to reconstructing, and maintaining classified roads while decommissioning unnecessary classified and unclassified roads.'

Recommended Actions: The Forest Plan goal is to construct the minimum number of roads to permit efficient removal of timber and mineral resources. This is continuing to occur; therefore no change is needed at this time.

PROTECTION: Insect and Disease Status; Monitoring Item P-1

ACTION OR EFFECT TO BE MEASURED:	Determine the level of insect and disease organisms following management activities to insure the health of residual and surrounding stands.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Insect and disease levels increase beyond normal levels.

Purpose: This monitoring item was established to ensure that insect and disease levels are not made worse by Forest management activities, particularly timber management. The Forest Plan requires that this item be reported every two years. The expected accuracy and reliability of the information are moderate.

Background: Insects and disease (I&D) levels in stands meeting the above criteria have remained at endemic (low) levels for the last two years. Management activities are normally designed using integrated pest management strategies to ensure insect and disease levels remain low from management activities. This includes treatments to physically reduce insect and disease damaged trees and subsequent fuel abatement to do the same.

Results: Densely growing trees, regardless of size, can come under stress, often predisposing them to insect and/or disease attack. Commercial (4,817 acres) and precommercial thinning (4,655 acres) treatments have occurred on the Forest over the last two fiscal years. Both treatments include reduction of stocking levels to reduce stress while improving species mixtures that are less susceptible to insect and disease problems. Insect and disease damaged trees are normally reduced during these operations. Mistletoe infected overstory trees on recently regenerated stands have been reduced on 215 acres. Pruning of white pine blister rust infected western white pine occurred on 555 acres. Prescribed burning following harvest and for wildlife habitat improvement sometimes increases insect activity in residual trees, but at a low level. Due to a recent outbreak of Douglas-fir beetle, it has been observed that Douglas-fir left as seed trees in regeneration harvest units are at higher risk following prescribed burning. Also, Douglas-fir surrounding these areas and in wildfire areas are more susceptible to beetle attack.

Evaluation: An insect and disease flight, activity reviews, service visits, stand exams, reforestation exams, permanent plot (growth plots) remeasurements, and benchmark exams indicate stands that have been regeneration harvested and those treated with some form of intermediate treatment are generally healthy, with only minor amounts of insect or disease that can cause significant problems.

The Forest has surveyed 3,325 acres in 2001 and 2002 for Douglas-fir beetle. Followup treatments included pheremone trapping and application of anti-aggregant pheremone on 1,454 acres.

Western gall rust continues to infect many lodgepole pine stands recently precommercial thinned. Root disease continues to infect regenerated species with low resistance, primarily in the western districts. The vast majority of stocking in these plantations is composed of intolerant species not highly susceptible to root disease.

White pine blister rust continues to infect natural white pine at a high rate. We rarely feature natural white pine as a crop tree, so this condition does not pose a threat to the forest timber resource

productivity. However, in stands where natural white pine is intended to remain a part of the stand composition and infection levels are moderate, branch pruning is being employed to reduce infection levels.

Recommended Actions: Based on the information stated above, insect and disease levels are at low levels in managed stands. Continue monitoring using the above surveys.

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