Forest Plan
Monitoring and Evaluation Report
FISCAL YEAR 2006
September 2007

Kootenai National Forest

United States Department Of Agriculture

Forest Service
Kootenai National Forest

United States Department of Agriculture **Forest Service** **Kootenai N.F.** **1101 U.S. Highway 2 W. Libby, MT 59923**

File Code: 1920

Date: September 28, 2007

Dear Forest Planning Participant:

This is the Kootenai's Forest Plan Monitoring Report for Fiscal Year (FY) 2006. This report includes information for Forest Plan Monitoring Item C-5 (Wildlife and Fisheries/Old Growth Habitat), C-7 (Wildlife and Fisheries/Threatened and Endangered Species Habitat), E-1 (Timber: Allowable Sale Quantity) and L-1 (Facilities: Road Access Management). Information in this report is also collected and reported annually to the U.S. Fish & Wildlife Service (USFWS).

Note, this Report will document that the 2003 AMS functioned as our "5-year summary report" (See AMS Technical Rerport page 2-3). The FY 2007 Report will also be identified as our 5-year summary report.

If you have any questions regarding this report, please contact Kirsten Kaiser at the Forest Supervisor's Office in Libby at 406-293-6211.

Sincerely,

PAUL BRADFORD
Forest Supervisor
Kootenai National Forest

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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. This item was last published in September of 2006. The expected accuracy and reliability of the information is moderate to high.

Background: The Forest Plan (Volume 1, page II-22) specifies that at any time 10 percent of the KNF land base below 5,500 feet elevation would be managed as old growth habitat for those wildlife species dependent on old growth timber for their needs. The old growth would be spread evenly through most major drainages, and would represent the major forest types in each drainage.

Kootenai Supplement (Supplement 85, 1991) to 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. Validation, as defined in the Manual, is "on-the-ground verification." One of the requirements is that a minimum of 10 percent of each third order drainage or compartment (or combination of 3rd order drainages or compartments) be designated as old growth habitat. If 10 percent old growth does not exist within a compartment, designate the best available, soon to be future old growth to bring the total up to 10 percent, or designate additional old growth from an adjacent area to make up the difference.

Mature stands identified as old growth replacement are stands replacing a current deficiency of higher quality (effective) old growth and will provide for old growth habitat in the future as they age and gain the desired attributes. 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.

Inventory and Mapping: The KNF has two separate and independent sources of information for old growth. These are:

1) Forest Inventory and Analysis (FIA) data used to calculate KNF Forest-wide old growth percentages. FIA old growth results for the KNF were available for the first time last year (2006).
2) GIS layer of stands identified as designated or undesignated effective old growth or replacement old growth.

1) <u>Old Growth Estimates from FIA Data</u>

The National Forest Inventory and Analysis (FIA) program provides a congressionally mandated, statistically-based, continuous inventory of the forest resources of the United States. The FIA inventory design is based on the standardized national FIA grid of inventory plots that covers all

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

The FIA provides a statistically sound representative sample designed to provide unbiased estimates of forest conditions at large and medium scales. This inventory design is appropriate for making estimates of old growth percentages at the scale of a national forest, or large areas of forest land. (More detail on the statistical foundation of using FIA data to assess old growth on national forests is found in: *Application of Forest Inventory and Analysis (FIA) Data to Estimate the Amount of Old Growth Forest and Snag Density in the Northern Region of the National Forest System by Raymond L. Czaplewski, Ph.D. November 5, 2004* [available from Northern Region, US Forest Service]).

FIA estimates for old growth cannot be used to determine whether or not the Forest is meeting the Forest Plan standard for old growth. The FIA estimate is for all forest lands (not only lands <5500 feet in elevation) and does not include lands managed as replacement old growth. The estimate from FIA is helpful, however, in comparing to the old growth GIS layer used by the Forest for managing old growth.

The FIA data used to estimate old growth on the KNF was collected from 1993 to 1995. To account for disturbance since the inventory, those FIA plots having any disturbance (e.g., wildfire) since the date of inventory and up to the year 2003 were coded as not meeting the old growth definition. This may underestimate the amount of old growth, since not all disturbance would necessarily result in a reduction to old growth. FIA data was originally established to be re-inventoried every 10 years. Starting in 2002, the program has re-measured 10% of plots every year, with 50% of the forest re-measured at this time.

2) Stand-level map of old growth

The KNF continues to use a Geographic Information System (GIS) layer to identify stands that are effective or replacement old growth to meet Forest Plan standards. The stand-level old growth layer provides for distribution of old growth across the Ranger Districts and landscape, and serves as a basis for project planning. The acres associated with the old growth layer indicate whether or not Forest Plan standards are being met.

The Forest has been validating portions of its lands for old growth over the past 19 years (1989-2006), with the exception of the year 2000 (due to extensive wildfire on the Forest). In 2002, in response to litigation, the Forest conducted a forest-wide validation and inventory of old growth, using various survey methods. FIA data for estimating the amount of old growth forest-wide was not available at this time. The mapping of old growth included all of those lands previously validated as old growth, as well as other National Forest lands. This inventory was conducted, in part, to verify that the Forest had an adequate amount of well-distributed old growth habitat to meet the Forest Plan standard (i.e., 10% of the National Forest lands below 5500 feet in elevation), as well as the condition of the old growth (whether it was considered effective or replacement).

Figure C-5-1 displays effective and replacement old growth forest-wide. Figure C-5-2 displays lands designated or undesignated for old growth management forest-wide.

Results: The results from the FIA estimate of old growth are documented in the attached report, "Estimates of Old Growth for the Northern Region and National Forests" by Bush et al, dated May 16, 2007. This report indicates the estimated percentage of old growth (effective) on all forested lands on the Kootenai National Forest is 9.0% with a 90% confidence interval of 7.2% to 10.9%. This is a slight change from the prior year, where the median was estimated at 8.8%. The change in the old growth estimate was because of a correction on how old growth criteria were applied to alpine larch, whitebark pine, and limber pine.

Acres from the stand level map are summarized forest-wide in Table C-5-1, displaying the total amount of old growth, whether the old growth is considered to be effective or replacement, and if the old growth has been designated or remains undesignated. There are approximately 1,870,000 acres of National Forest lands below 5500 feet in elevation. As of September, 2006, the stand level inventory indicates a total of 297,173 acres (15.9%) of National Forest lands below 5500 feet in elevation are either effective or replacement old growth. Approximately 10.6% (199,109 acres) of those lands were determined to be effective old growth and an additional 5.3% (98,064 acres) identified as replacement old growth.

Comparison: This is the second year FIA old growth data estimates have been available Forest-wide. For existing old growth, the two separate tools for inventorying and monitoring old growth show similar results. The FIA data estimates old growth forestwide at 9.0% of the forest with a 90% confidence interval of 7.2% to 10.9%. The acres of effective (existing) old growth in the stand-level GIS layer total to 10.6% of forested lands less than 5500 feet in elevation. Although the FIA data shows less old growth at the mean (9.0%) than the stand level map (10.6%), the stand level map results are within the 90% confidence interval for FIA. As stated earlier, these data sources are measures for different land bases. The FIA percentage is forest-wide, while the stand level data is for lands <5500 feet in elevation. Another reason for the difference may be attributed to the age of the FIA data and the assumption that disturbed plots (e.g., FIA plots with any type of wildfire since inventory) do not meet old growth criteria, resulting in a conservative estimate from FIA.

Evaluation: The monitoring and evaluation of old growth habitat continues to indicate that the Forest is meeting its Forest Plan requirement for managing 10% of the forest as 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 on areas not validated and 2) designate existing old growth in areas not validated. Project level analyses will continue to use the stand-level GIS layer in their project level assessments.

Table C-5-1 Stand Level Old Growth Summary

Oldgrowth updated September 2006

9/20/2006

Forestwide Old Growth Below 5500' Elevation

District	FS ACRES (total FS acres under 5500' minus lakes and highways)	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*		FS Acres DESIGNATED as an old growth Management Area*	
		designated and effective (plot, walk, vrec)	designated and effective (pi)	designated and replacement	desig unknown (original FP - categorized	undesignated and effective (plot, walk, vrec)	undesignated and effective (pi)	undesignated and replacement	TOTAL acres effective og	Percent of FS Acres in effective og		Acres of all old growth	Percent of FS Acres as all types old growth	Acres designated as old growth MA	Percent of FS Acres as old growth MA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
D1	245,632	22,589	322	4,652	275	15,013	817	6,634	38,450	15.65%	11,286	49,736	20.2%	27,838	11.3%
D3	183,772	17,793	2,362	1,252	1,461	17,049	1,764	0	38,194	20.78%	1,252	39,446	21.5%	22,868	12.4%
D4	504,316	37,865	2,372	15,961	1,528	4,283	3,924	3,491	46,842	9.29%	19,452	66,294	13.1%	57,726	11.4%
D5	557,302	43,956	1,569	22,462	621	3,237	4,944	6,799	51,473	9.24%	29,261	80,734	14.5%	68,608	12.3%
D7	378,187	5,072	2,257	16,945	15,939	1,643	10,860	19,868	24,149	6.39%	36,813	60,962	16.1%	40,213	10.6%
Forest Total	1,869,209	127,275	8,882	61,272	19,824	41,225	22,309	36,792	199,109	10.65%	98,064	297,173	15.9%	217,253	11.6%

** 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 (reference FP Appendix 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 (reference FP Appendix 17, pg.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 (reference FP Appendix 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: Reference FP Appendix 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)

(14) Acres and Percent of FS acres Designated as an old growth Management Area (MA). Includes effective and replacement old growth. Does not include designated old growth over

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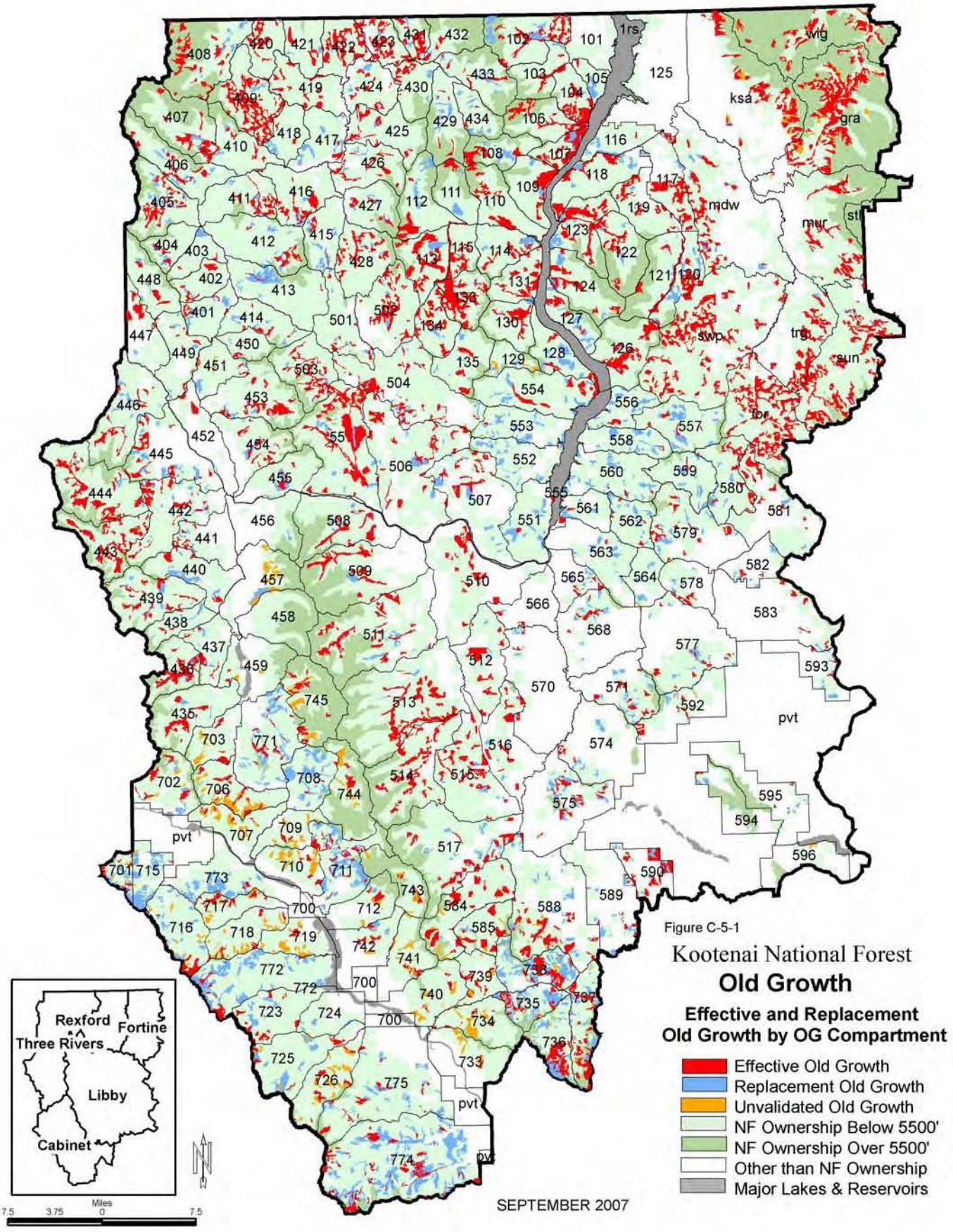

Rexford
Fortine
Three Rivers
Libby
Cabinet
Miles
7.5 3.75 0 7.5
Figure C-5-1
Kootenai National Forest
Old Growth
Effective and Replacement
Old Growth by OG Compartment
Effective Old Growth
Replacement Old Growth
Unvalidated Old Growth
NF Ownership Below 5500'
NF Ownership Over 5500'
Other than NF Ownership
Major Lakes & Reservoirs
SEPTEMBER 2007

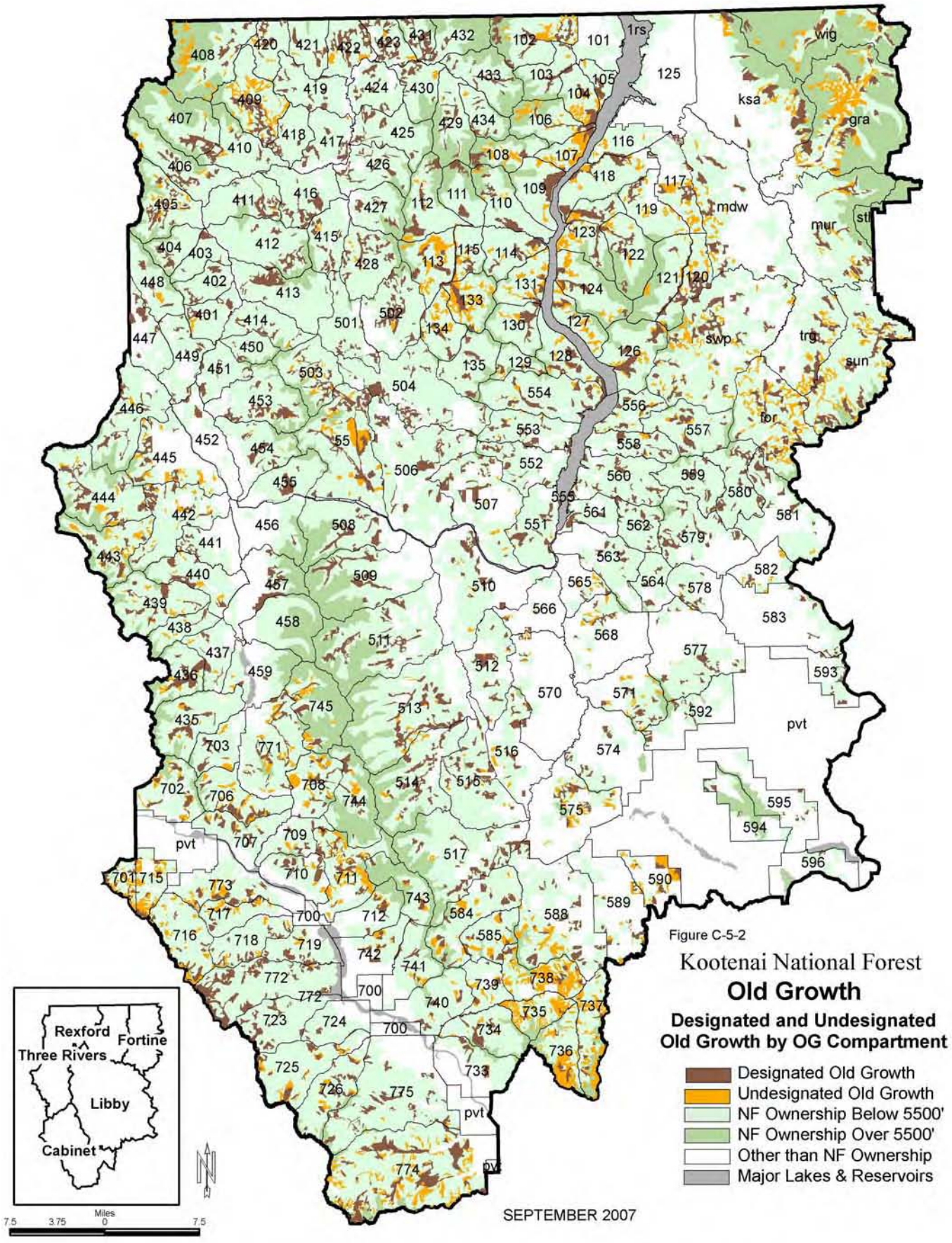
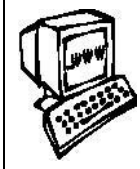


Figure C-5-2
Kootenai National Forest
Old Growth
Designated and Undesignated
Old Growth by OG Compartment
Designated Old Growth
Undesignated Old Growth
NF Ownership Below 5500'
NF Ownership Over 5500'
Other than NF Ownership
Major Lakes & Reservoirs
Rexford
Fortine
Three Rivers
Libby
Cabinet
Miles
7.5 3.75 0 7.5
SEPTEMBER 2007

Region One Vegetation Classification, Mapping, Inventory and Analysis Report			$\bar{x} = \frac{\sum x}{n}$
Numbered Report 07-06 v1.2		**May 16, 2007**	

Estimates of Old Growth for the Northern Region and National Forests

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Following is an update in old growth estimates for Region 1 which was reported in *Estimates of Old Growth for the Northern Region and National Forests* (Bush and others, 2006). This update is due to an oversight which was found when assessing old growth in the western Montana zone old growth forest type of alpine larch, whitebark pine, and limber pine. Previously, all plots that met old growth criteria for this forest type were not flagged as old growth. This has been corrected and estimates within this report reflect those changes. Old growth estimates for the Bitterroot, Flathead, Kootenai, and Lolo National Forests as well as total estimates for Region 1 were slightly affected by this change.

Introduction

This document summarizes analysis conducted using Forest Inventory and Analysis (FIA) data to estimate the percentage of old growth on forested lands in the Northern Region and on National Forests in the Northern Region.

Overview of FIA

The national Forest Inventory and Analysis (FIA) program provides a congressionally mandated, statistically-based, continuous inventory of the forest resources of the United States. Since 1930, the FIA program has been administered through the Research and Development branch of the Forest

Service, which makes it administratively independent from the National Forest System. The Interior West Forest Inventory and Analysis work unit, headquartered at the USFS Rocky Mountain Research Station in Ogden, Utah oversees the FIA inventory in Region 1. More information on IW-FIA is available on the internet at: http://www.fs.fed.us/rm/ogden/sitemap/index.shtml.

FIA inventory design is based on a national hexagon of inventory plots. Data is collected on all forested portions of the plots, throughout the United States, regardless of ownership. FIA protocols specify sample plot location within this hexagonal grid. Data collection standards are strictly controlled by FIA protocols. The sample design and data collection methods are scientifically designed, publicly disclosed, and repeatable. Data collection protocols are publicly available on the internet (http://www.fia.fs.fed.us/). There are also stringent quality control standards and procedures, carried out by FIA personnel of the Rocky Mountain Research Station. All of this is designed to assure that data is collected consistently throughout the United States, and that stated accuracy standards are met by the field crews.

FIA Sampling

To estimate the percent old growth for large areas, such as the Northern Region, individual National Forests, or even large landscape areas, it is infeasible to maintain an inventory for every acre of the millions of acres of forestland. FIA provides a statistically-sound representative sample designed to provide unbiased estimates of forest conditions at broad- and mid-levels. The FIA sampling frame uniformly covers all forested lands, regardless of management emphasis. Therefore, wilderness areas, roadless areas, and actively managed lands all have the same probability of being sampled.

Table 1: Date of Inventory by National Forest

National Forest	Date of FIA Periodic Inventory
Eastern Montana	
Beaverhead-Deerlodge	1996-1997
Custer	1997
Helena	1996-1998
Gallatin	1997-1998
Lewis & Clark	1996-1997
Western Montana	
Bitterroot	1994-1995
Flathead	1993-1994
Kootenai	1993-1997
Lolo	1995-1996
Northern Idaho	
Idaho Panhandle	2000-2003
Clearwater	1998-2002
Nez Perce	2000-2002

Using FIA data to assess the percent of old growth allows the Region to base its monitoring on an unbiased, statistically sound, independently designed and implemented representative sample of forest lands. This inventory is reasonably current because FIA plots in Region 1 were installed during 1993 to 2004 (see Table 1 for specific inventory year by National Forest). All forested[1] plots that are located on the National Forest lands are used to derive these estimates. Those FIA plots in which wildfire or harvest have occurred since the dates of inventory until November, 2003 were assumed to not meet the old-growth criteria. This results in conservative estimates as not all wildfire and harvest activities remove all old growth on the landscape. To remain current, FIA has started to re-measure 10% of its plots every year. As these re-measured plots accumulate, we will periodically update our FIA old-growth analysis and report.

All plots installed in Montana from 1993 until 1996, utilized a sample location (field plot) composed of five to seven variable-radius plots with trees 5 inches and larger, in diameter at breast-height (DBH) tallied with a basal area factor of 40. The number of plots installed depended upon the year of inventory; early inventories had a seven-plot cluster, whereas those inventories collected 1995-1996 had five plots.

After 1996, FIA adopted a national plot layout consisting of a cluster of four plots. Trees 5-inches DBH and larger were measured on a 1/24th-acre plot. In 2002, Region 1 worked with IW-FIA to modify the national layout by adding a ¼-acre macro-plot. These protocols were integrated into the IW field procedures and data collection software, and loaded into IW-FIA's database. These protocols dictate that trees 5.0 – 20.9 inches DBH were measured on the 1/24th-acre plot and trees 21.0 inches DBH and larger were measured on the ¼-acre plot. Data collected in 2002 was completed by IW-FIA crews while crews were collecting data. All plots that did not have the ¼-acre plot installed in 2002 had the ¼-acre plot augmented to the standard FIA plot layout in 2003 and 2004. These data were measured by contract crews, overseen by Region 1, using IW protocols and software. For a detailed description of field procedures see http://fsweb.ogden.rmrs.fs.fed.us/data_collection/data_collection.html

FIA field procedures dictate that age for trees 3.0" DBH and larger is measured by counting annual growth rings at breast height, and recorded as "breast-height age". Breast-height (BH) is defined as 4.5' tall. It follows that BH age is the number of years the tree has survived since it reached 4.5 feet tall, which is less than its total age. In temperate regions similar to the Northern Region, coniferous trees always take several years to reach breast height, and these years need to be added to "breast-height age" to get the total age of the tree. The minimum age criteria for old growth used in *Green and others (1992, errata corrected 02/05)* is total age rather than breast-height age. The data used for estimating old growth should be consistent with *Green and others* definitions. Therefore, a conservative estimate of the number of years a currently large tree took to reach BH is added to the BH age (ring count) to account for the difference between the old-growth definition of tree age and FIA field measurement protocols.

1 "..land at least 10 percent stocked, or currently nonstocked but formerly having such stocking, with timber and/or woodland trees, and where human activity on the site does not preclude natural succession of the forest (i.e., the site will be naturally or artificially regenerated)." *Interior West Forest Land Resource Inventory Field Procedures, 1995-1996.*

See Estimates *of Years to Breast Height for Large Conifer Tree Species in the Northern Region* (Berglund, Bush, and Zack, in preparation).

Analysis Techniques

The R1-FIA Summary Database was used to conduct this analysis. As its name suggests, this database is comprised of several tables of summarized attributes derived from FIA field-collected data. This database has the functionality to compute the mean, standard error, and confidence intervals for percent old growth.

Because FIA data comes from a statistical sample rather than a 100% census, attributes calculated from this data are estimates and the accuracy of these estimates can be computed and reported as confidence intervals. To calculate the confidence intervals a technique called "bootstrapping" is used. Bootstrapping is a statistical method that is independent of the distribution of the underlying data. For more information on bootstrapping, see Leach (2002) *A Case Study in the Evaluation of Confidence Interval Algorithms* and Leach (2005) Bootstrap *Calculation of Confidence Intervals for the Estimates of Means by Stratum.*

The Northern Region uses a 90%-confidence interval for describing the reliability of these estimates. The 90% level was chosen to provide a fairly precise level for a biological attribute that can be very variable. It can be thought that if a different set of randomized sample points were collected 100 different times, the estimates of the percent old growth would be within the 90%-confidence interval 90% of the time. This also indicates that if every tree on every acre were measured, there is a 90% probability that the true proportion of old growth for the population would be within this confidence interval. Or that 9 out of 10 times, the true population mean is within the confidence interval derived from the sample.

For further information on the R1 FIA Summary Database see *Overview of R1 FIA Summary Database*, Bush and others (2006).

Northern Region Old Growth Criteria

Numerous definitions for old-growth forests all tend to focus on "criteria relating to the age, size, and successional stage of overstory trees . . .", (Foster and others 1996). These attributes identified by Foster and others are consistent with the four important attributes in the Northern Region old growth criteria documented in Green and others, i.e., minimum age, diameter, and trees per acre (TPA) over minimum age and diameter thresholds, and minimum basal area, an indicator of stand density. Moreover, Foster and others (1996), in agreement Spies and Franklin (1996), suggest an old-growth ecosystem is distinguished by old trees, but is not necessarily in the late-successional condition nor free of evidence of human activities.

The Northern Region's definition of old growth, as documented in Green and others, is used to determine if an FIA plot meets old growth minimum criteria. These minimum thresholds are documented in tables 1-3 of the Green document and are the key attributes in identifying old growth. A variety of "associated characteristics" have been identified that can be useful in determining the quality of Old Growth communities for some specific purposes when

developing a project-level management approach however, these are not required characteristics as per the Green and others document and therefore are not used for the broad-level analysis.

FIA plot-level data and analysis methods used here are similar to the plot-level data and analysis methods used by Green and others (2005) when determining the old growth criteria. Neither dataset or analysis method specifies a minimum acre requirements for the size of an old growth polygon.

For further detail on the statistical foundation of using FIA data to assess old growth on national forests see: *Application of Forest Inventory and Analysis (FIA) Data to Estimate the Amount of Old Growth Forest and Snag Density in the Northern Region of the National Forest System (*Czaplewski, 2004).

Percent Old Growth in the Northern Region and on Individual National Forests

Table 2 provides a summarization of the estimates of percent old growth on forest-lands for the Northern Region and individual National Forests as per the Region 1 Green and others definition of old growth. Forests have varying old growth requirements in their current Forest Plans which are not reflected in this table. See the Forest Plans and/or Monitoring Reports for more information on old growth standards and guidelines for each Forest.

Table 2: Northern Region and individual National Forest estimates of percent of old growth, standard error, and 90%-confidence intervals.

Unit	Percent Old Growth Estimate	90%-Confidence Interval - Lower Bound	90%-Confidence Interval - Upper Bound	Total Num PSUs	Num Forested PSUs
Northern Region	13.7%	12.9%	14.4%	3883	3423
Beaverhead-Deerlodge	22.9%	20.5%	25.4%	547	442
Bitterroot	12.8%	10.1%	15.6%	252	226
Idaho Panhandle	11.8%	9.6%	14.0%	413	397
Clearwater	9.4%	7.3%	11.8%	305	300
Custer	10.1%	6.4%	14.1%	195	105
Flathead	11.0%	9.0%	13.1%	382	338
Gallatin	25.5%	21.7%	29.3%	285	223
Helena	10.9%	7.8%	14.1%	149	138
Kootenai	9.0%	7.2%	10.9%	370	352
Lewis & Clark	13.3%	10.6%	16.2%	299	267
Lolo	9.6%	7.7%	11.5%	347	327
Nez Perce	14.4%	11.8%	17.2%	339	308

Distribution of Old Growth within Individual National Forests

Using FIA data, the same methodology can also be used to estimate the percent old growth on medium to large geographic areas, landscapes, or watersheds within individual National Forests. Estimates of old growth across these areas provide a means for examining the distribution of old growth within a National Forest. Reports for individual National Forests provide this watershed or landscape-level information. In order to obtain reliable estimates of old growth with meaningful confidence limits, the landscape area must be large enough to encompass a reasonable number of FIA plots. Because of the resolution of the FIA data, it should not be used for estimates within a project-area as there are seldom enough plots to derive estimates of old growth with any sort of reliability.

Relationship to Forest Maps of Allocated Old Growth Stands, and Project-level Mapping

Broad-level estimates of old growth are intended to be used in conjunction with project-level estimates and associated maps and maps of stands allocated to old growth management by a National Forests. These broad-level estimates are intended to allow land managers to assess forest-plan compliance and to set the context for the maps of stands allocated to old growth management and their project-level estimates which are useful tools for project design and implementation.

Furthermore, FIA data provides mid- and broad-level estimates. The resolution of the grid is too course to derive reliable estimates within project areas. At the project-level, it is recommended that Forests conduct stand-based mapping, inventory, and analysis to meet their information and analysis within the project area.

Literature Cited

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WILDLIFE & FISHERIES: Threatened & Endangered Species Habitat; Item C-7

ACTION OR EFFECT TO BE MEASURED:	Provide habitat adequate to ensure KNF contribution to the recovery of Threatened and Endangered (T&E) Species including: Lynx, 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 KNF.

Purpose: This monitoring item was established to help ensure that the KNF contributes to the recovery of listed threatened and endangered species. The Forest Plan requires that this item be reported annually. This item was last published in September of 2005. The expected precision and reliability of the information is high and moderate, respectively.

Evaluation:

Gray Wolf – The Wolf Recovery Plan (USFWS, 1987) provides guidance for the recovery of the gray wolf. The KNF is part of the Northwest Montana Wolf Recovery Area. The recovery goal for this area is ten wolf packs, which has been met for four consecutive years (USFWS, 2007). Wolves from each of the known packs spend at least a portion of their time on the Forest and the remainder on other National Forests, State, or private lands.

Following is a summary of the known wolf packs during 2006 (USFWS et.al. 2007).

Candy Mountain Pack – The dispersal of Candy Mountain wolf NW030F was documented in 2006. Female wolf NW030F had been missing since December 2005 and was located dead on 8/1/06 about 68 miles to the southeast of the pack's territory. This pack's territory is in the Yaak River drainage. The pack produced pups at a new den and is now made up of 10 individuals. This pack has 1 radio collar (#351).

Fishtrap Pack **–** This pack produced pups at a new den in 2006. At least 4 pups were documented, but only 2 could be observed by the end of the year. This pack has 2 radio collars (# 266 and 270). The pack occupies an area in the southeast corner (McGinnis Meadows and East Fisher Creek) of the Libby Ranger District but also uses the Fishtrap and main Thompson River drainages on the Plains/Thompson Falls District of the Lolo National Forest. This pack is considered a breeding pair and there are 8 wolves in the pack.

Kootenai South Pack – Both collared wolves in this pack dispersed in 2006. One was located 27 miles to the south and has been seen with another wolf. The other has joined the Lost Soul pair. A male wolf that had been missing since June 2006 was located in September about 44 miles to the northeast in the North Fork Flathead River drainage in Canada. A female wolf was trapped and collared in July, but she was legally harvested in Canada in November. At the end of 2006 the pack remains uncollared. There are 4 wolves in the pack and it is not considered a breeding pair.

Lost Soul Pack – This pack consists of 2 wolves and is not considered a breeding pair. It occupies an area between Koocanusa Reservoir and Libby. One wolf is radio collared. The female of this pack came from the Kootenai South Pack.

Lydia Pack – The Lydia pack is a new pack discovered in 2006. The pack produced pups for the first time in 2006 and is considered a breeding pair. There are five wolves in the pack. The pack is not collared but estimated to occupy an area in and around the Pinkham Creek drainage.

Murphy Lake Pack – This pack's territory is between Eureka and Whitefish. The number of wolves was unknown in 2006. The pack was not counted as a breeding pair this past year. There was little wolf sign found throughout their traditional home range. Wolf presence is verified, but otherwise their status is unknown. The pack is not collared.

Pulpit Mountain Pack – This is a new pack in 2006. It is a breeding pair with a total of 8 wolves in the pack. There were 5-8 pups seen in May. Illegal pup mortality was recorded in June. The pack remains uncollared, but its territory is estimated to be in the O'Brien and China Creek drainages.

Wolf Prairie Pack –There are a total of 3 wolves in this non-breeding pack. The pack's territory is on the eastern edge of the KNF. The alpha female was hit and killed by a train at the end of February and the male has been missing since that time. One wolf was caught and collared during the summer.

Calder Mountain – This is a pack of 6 wolves with a breeding pair. It is a border pack that counts toward the Idaho population estimate. It occupies an area west of Troy. There were very few reports of this pack in Montana in 2006. The pack is not collared.

Kootenai North – There were 4 wolves in this pack in 2006. It spends most of its time in Canada west of Koocanusa Reservoir and does not count toward the Montana population estimate. It was located twice in the U.S. in 2006.

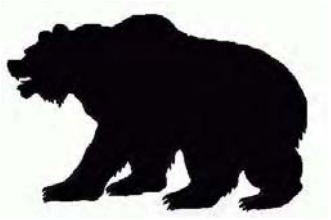
Habitat and Population Trend: Wolf numbers using the Kootenai continue to increase, reflecting continuing suitable habitat conditions. Wolf habitat conditions did not change significantly in 2006 compared to previous years. Big game populations are providing adequate prey resources for continued wolf population growth.

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 seven, 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 KNF area is about 15 percent of the zone. Based on this percentage, the Kootenai would be providing a minimum of eight nesting pairs (52 x 0.15) toward the recovery goal. At the end of 2006 there were 18 pair territories on National Forest lands. There were also 21 pair territories on private, state or other federal lands within the KNF area. Eleven pair territories were active on KNF lands in 2006, with 4 inactive and the status of 3 unknown.

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.

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 2006 show a total of 69 wintering (53 mature and 16 immature) bald eagles. This is below the 20 year (1987-2006) average of 95 wintering eagles.

Nesting surveys show the 2006 nesting eagle population slightly down on National Forest lands, with 5 young fledged from 11 active nests. The overall reproduction of 20 (including private land sites) was slightly below the average year (23 fledged is the 20 year average). USFWS believes the bald eagle has achieved recovery goals and they've proposed removing them from the threatened species list.



Grizzly Bear – The KNF 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 four percent of the NCDE is located in the extreme northeast corner of the Forest. 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. Management of roads is also an important factor in grizzly bear recovery.

Unduplicated Sightings of Females with Cubs: In 2006, there was one credible sighting of unduplicated female grizzly bears with cubs of the year in the Kootenai portion of the CYE, and none in the KNF portion of the NCDE. The Kootenai portion of the NCDE was below the six year average for number of females sighted with cubs, as was the CYE.

Distribution of Females with Young: Three of the seventeen BMUs on the Kootenai portion of the CYE were occupied by females with young in 2006. The total number of different BMUs occupied over the entire recovery zone during the past six years was twelve, compared to the Recovery Plan goal of eighteen (personal communication: Wayne Kasworm, September 2007). The one BMU in the Kootenai's portion of the NCDE was occupied by two females with young during the year. These numbers are above the six year average for the NCDE and below average for the CYE.

Mortality: There were no human caused grizzly mortalities reported in 2006 for the CYE and two in the Kootenai portion of the NCDE.

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-7-1. These levels do not yet meet recovery goals for the CYE.

Access Management: A Forest Plan amendment (Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones, 2004) has established additional access management direction in the CYE. Identified monitoring parameters include Open Motorized Route Density (OMRD), Total Motorized Route Density (TMRD) and core.

Tables C-7-2 A, B, and C display Core, OMRD, and TMRD values by BMU for bear years (BY) 1999 through 2006. Changes in core, OMRD and TMRD in FY06 are the result of management activities, activities on private land, and field verified corrections in road status from bear year (April 1 to November 15) 2005.

Table C-7-1 Grizzly Bear Females with Cubs, Distribution of Females with Young, and Human-Caused Mortalities

Bear Year (BY)	NCDE (KNF Portion)			CYE (KNF portions only)		
	# 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
2001	2	1	0	1	3	2
2002	2	1	0	4	7	5
2003	0	0	2	2	7	0
2004	4	1	1	1	5	0
2005	2	1	0	1	3	3
2006	0	1	2	1	3	0
Six-year Average	1.3	0.8	0.8	1.7	*4.7	1.7

*Twelve different BMUs were occupied during the past six years.

Table C-7-2A Bear Year (BY) (4/1 thru 11/30) Percent Core for the CYE by BMU

BMU	BY 99 %	BY 00 %	BY 01 %	BY 02 %	BY 03 %	BY 04 %	BY 05 %	BY 06 %
1 Cedar	84	83	83	83	83	84	85	85
2 Snowshoe	77	78	77	77	78	78	77	76
3 Spar	57	58	61	62	62	63	63	62
4 Bull	61	63	63	62	62	63	63	63
5 Saint Paul	61	62	62	63	60	60	59	60
6 Wanless	51	53	55	55	54	56	54	54
7 Silver Butte/Fisher	66	66	66	66	66	66	67	67
8 Vermilion	57	57	56	56	56	56	56	56
9 Callahan	53	56	57	57	59	60	59	58
10 Pulpit	45	48	49	49	52	52	51	51
11 Roderick	52	55	54	54	53	53	53	52
12 Newton	56	56	57	57	56	56	56	56
13 Keno	56	59	62	62	61	61	61	59
14 NW Peak	60	56	56	56	57	57	56	55
15 Garver	46	48	47	50	50	48 *	46	45
16 E Fk Yaak	40	45	45	45	49	55	54	53
17 Big Creek	42	49	50	50	50	50	49	54
Average	57	58	59	59	59	60	59	59

Highlighted value does not meet standard established in 2004.

* In BMU 15, percent core change is the result of an error correction in BY03. Correction was made after on-the-ground validation of road status.

Bear Year (BY) Percent Core for the NCDE by BMU

BMU	BY 99 %	BY 00 %	BY 01 %	BY 02 %	BY 03 %	BY 04 %	BY 05 %	BY 06 %
Murphy Lake NC-1	69	70	70	72	72	72	72	72

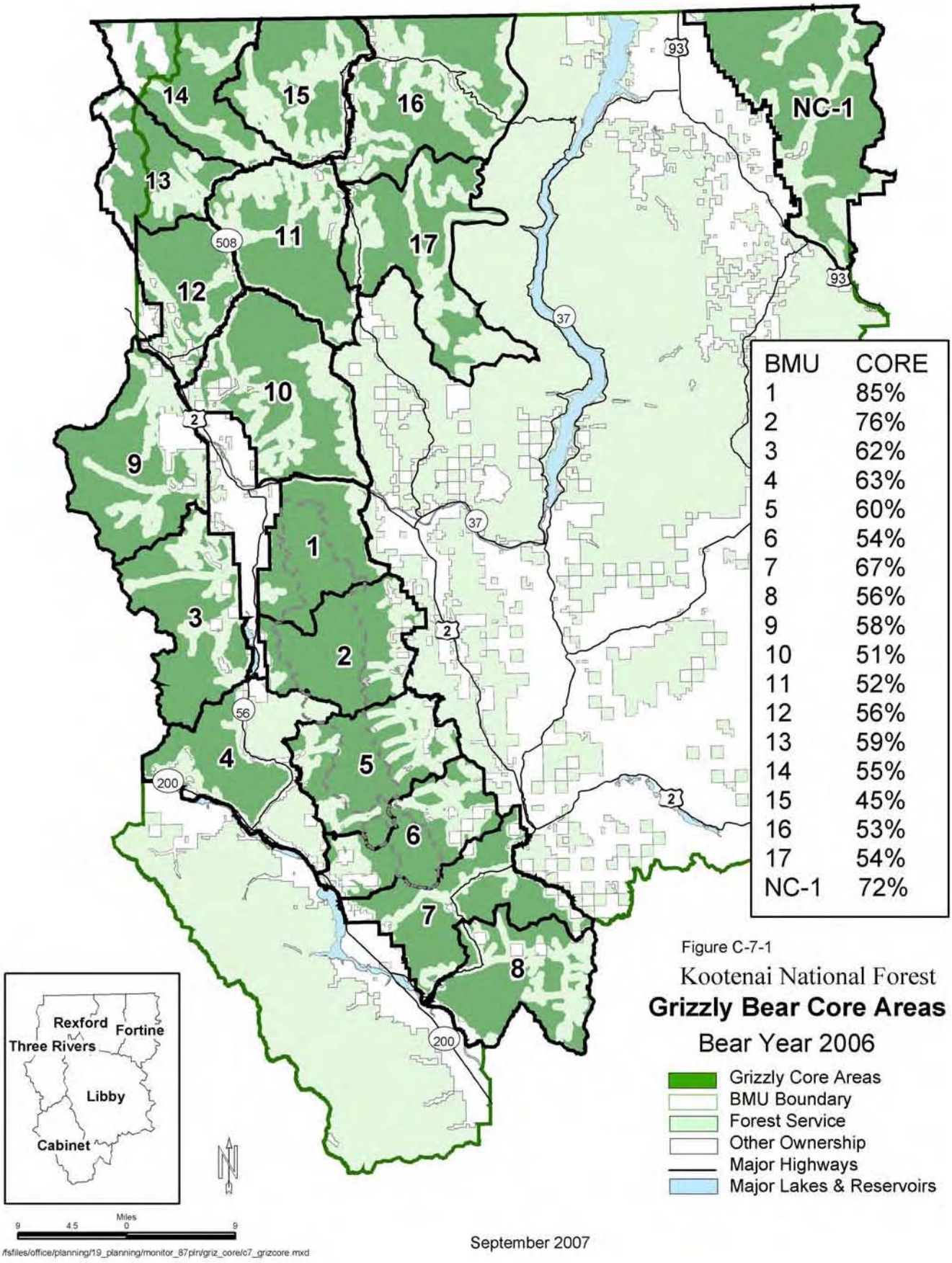


Figure C-7-1

Kootenai National Forest

Grizzly Bear Core Areas

Bear Year 2006

Grizzly Core Areas
BMU Boundary
Forest Service
Other Ownership
Major Highways
Major Lakes & Reservoirs

Table C-7-2B **Bear Year (BY) OMRD Conditions (% BMU > 1 mi/mi^2) for the CYE by BMU**

BMU	BY 99 %	BY 00 %	BY 01 %	BY 02 %	BY 03 %	BY 04 %	BY 05 %	BY 06 %
1 Cedar	13	12	12	12	12	13	14	12
2 Snowshoe	18	17	17	17	17	17	19	20
3 Spar	23	24	26	27	24	25	26	27
4 Bull	39	36	36	36	36	37	37	36
5 Saint Paul	28	27	27	26	27	26	27	27
6 Wanless	32	34	34	33	37	33	35	35
7 Silver Butte/Fisher	23	23	23	23	23	23	24	23
8 Vermilion	11	32	32	32	32	32	32	32
9 Callahan	36	32	32	32	26	26	28	28
10 Pulpit	50	45	41	41	41	41	42	41
11 Roderick	33	29	29	31	30	29	28	28
12 Newton	43	45	43	43	41	41	42	42
13 Keno	37	34	33	28	33	33	34	34
14 NW Peak	32	28	35	28	27	28	28	28
15 Garver	30	31	31	31	31	29	33	30
16 E Fk Yaak	36	31	28	29	28	31	28	28
17 Big Creek	37	32	32	31	31	31	29	31
Average	29	28	30	31	31	31	30	30

Highlighted value does not meet new standard established in 2004.

Bear Year (BY) OMRD Conditions (% BMU > 1 mi/mi^2) for the NCDE by BMU

BMU	BY 99 %	BY 00 %	BY 01 %	BY 02 %	BY 03 %	BY 04 %	BY 05 %	BY 06 %
Murphy Lake NC-1	23	20	20	19	19	20	20	20

Table C-7-2C Bear Year (BY) TMRD Conditions (% BMU > 2 mi/mi^2) for the CYE by BMU

BMU	BY 99 %	BY 00 %	BY 01 %	BY 02 %	BY 03 %	BY 04 %	BY 05 %	BY 06 %
1 Cedar	9	11	11	10	11	10	8	8
2 Snowshoe	15	14	14	14	14	14	14	15
3 Spar	31	30	27	26	26	24	24	24
4 Bull	27	26	26	26	26	26	26	26
5 Saint Paul	21	21	21	21	21	21	24	23
6 Wanless	34	33	32	32	32	31	31	33
7 Silver Butte/Fisher	19	20	20	20	20	21	20	21
8 Vermilion	21	21	23	23	23	23	23	23
9 Callahan	31	28	27	27	26	26	26	26
10 Pulpit	37	34	32	32	30	31	29	28
11 Roderick	31	27	28	28	28	29	29	28
12 Newton	28	31	29	30	31	31	31	30
13 Keno	26	24	24	24	24	23	24	25
14 NW Peak	22	26	26	26	25	26	26	26
15 Garver	34	32	32	30	29	29	34	33
16 E Fk Yaak	42	38	38	38	30	25	26	26
17 Big Creek	33	27	26	26	25	25	25	20
Average	27	26	26	24	25	24	25	23

Highlighted value does not meet new standard established in 2004.

Bear Year (BY) TMRD Conditions (% BMU > 2 mi/mi^2) for the NCDE by BMU

BMU	BY 99 %	BY 00 %	BY 01 %	BY 02 %	BY 03 %	BY 04 %	BY 05 %	BY 06 %
Murphy Lake NC-1	15	12	12	6	6	6	6	6

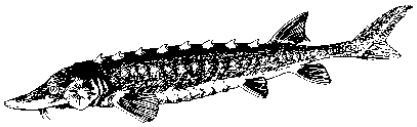
Bears Outside the Recovery Zone (BORZ): In addition to the monitoring items inside the recovery zone, the 2004 Forest Plan Amendment established access standards for areas outside the recovery zones that were occupied by grizzly bear. The standards for bears outside the recovery zone (BORZ) polygons are: no increases in linear open road density above baseline conditions and no permanent increases in linear total road densities above baseline conditions. Table C-7-3 shows the baseline conditions established as of 2003 and corrected in 2005 and reporting year status.

Table C-7-3 Linear Open and Total Road Densities (miles/mile^2) by BORZ Polygon

BORZ Polygon	Baseline Linear Open Road Density (ORD)	FY 04	FY 05	FY 06	Baseline Linear Total Road Density (TRD)	FY 04	FY 05	FY 06
Clark Fork	0.9	0.9	0.9	0.9	2.6	2.6	2.6	2.6
Troy	1.2	1.1	1.1	1.1	2.6	2.5	2.5	2.5
Cabinet Face	2.2	2.2	2.2	2.2	3.9	3.9	3.9	3.9
West Kootenai	1.3	1.3	1.3	1.3	3.0	3.0	3.0	3.0
Tobacco	2.0	1.8	2.0	2.0	3.0	3.3	3.0	3.0
Libby	1.9	1.9	1.9	1.9	3.4	3.4	3.4	3.4
Fisher	1.0	1.0	1.0	1.0	2.7	2.7	2.7	2.7

Summary: Sightings of female grizzly bears with cubs of the year in FY06 were the same as FY05, and the six year average has slightly decreased. Females with young occupied the same number of BMUs as in the previous year, and the number was below average for the CYE. There were no human caused grizzly mortalities in 2006. Overall, open and total route densities declined slightly during the year. The amount of total core area in grizzly habitat remained approximately the same as last year (see Figure C-7-2A). The grizzly bear population trend in the CYE has about a 91% probability that it is declining (Kasworm et.al. 2006).

Lynx – The Canada lynx was listed as threatened in March, 2000. The KNF currently manages for lynx habitat using the Canada Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et. al. 2000). The Forest Service Northern Region is in the process of completing a Region wide amendment to Forest Plans for all forests in R-1 with lynx or lynx habitat. In compliance with the LCAS the Forest delineated 47 Lynx Analysis Units (LAUs) which approximate a lynx home range size. At the end of 2006 all LAUs except one (#14104) met the LCAS habitat standards ($\geq$ 10% denning habitat, $\leq$ 30% unsuitable condition, and $\leq$ 15% changed to unsuitable condition in last 10 years). One LAU does not meet the unsuitable condition standard as it has 32% lynx habitat in an unsuitable condition. This LAU does not meet the standard due to natural wildfire events. 20 of the 47 LAUs were known to be occupied by lynx in 2006.



White Sturgeon -- The US Fish and Wildlife Service (FWS) Recovery Plan for the Kootenai River white sturgeon was signed on September 30, 1999. The short-term goals of the Plan are to re-establish 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 down listing 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 25 years following the approval of the Plan.

Recovery of white sturgeon is managed by Idaho Fish and Game, Kootenai Tribe of Idaho, and Montana Fish, Wildlife and Parks. 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 FY06 were found to have No Effect on the species.

In 2006, the FWS issued a biological opinion regarding the Army Corps of Engineers' and the Bonneville Power Administration's proposed operation of Libby Dam and its effect on the Kootenai River white sturgeon and its critical habitat (USFWS 2006). Although the proposed action includes provisions for augmenting flows, creating appropriate water depths, and for increasing the amount of rocky substrate within a portion of sturgeon breeding habitat, these actions are experimental, the schedule for their implementation is not well defined, and their effects on the sturgeon are uncertain. The final opinion includes findings that the proposed action will jeopardize the continued existence of the Kootenai River white sturgeon and adversely modify its critical habitat.

Ongoing population research on the white sturgeon has indicated that from nine to 20 spawning events occur annually in the Kootenai River and many viable embryos are produced (Paragamian and Wakkinen 2002). Most of the post-Libby Dam spawning events have been documented in areas where substrate conditions appear to be unsuitable for egg incubation and larval rearing (Paragamian et al. 2001) and no larvae and very few wild juveniles have been collected despite years of intensive sampling (Rust and Wakkinen 2005). Releases of hatchery reared juveniles (as young as 9 months of age at release) consistently exhibit successful growth, and second year survival rates exceed 90% (Ireland et al. 2002). Between 1992 and 2004, the Kootenai River sturgeon population has been augmented with nearly 47,000 juveniles (age 1 and 2) from the Kootenai Tribe of Idaho Conservation Aquaculture Facility and the Kootenai Sturgeon Hatchery. The most recent population estimate in 2006, from the Idaho Department of Fish and Game indicates there are approximately 450 adult sturgeons in the population (Paragamian et al. 2005).

Bull trout -- The Kootenai National Forest continues to consult with the USFWS on all proposed activities under Section 7(a)(2) of the Endangered Species Act. The Forest also works 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.

The East Fork Pipe Creek Bank Stabilization project was submitted to the FWS in FY06 for formal consultation. The determination of the biological assessment was: May Affect, Likely to Adversely Affect bull trout. This work included instream channel work, placement of large wood aggregates, rock structures, and armoring at the base of an unstable slope to isolate a chronic sediment source upstream of known bull trout spawning habitat. Additional efforts by the Forest in bull trout watersheds included road decommissioning with culvert removals in North Fork Keeler, tributaries to North Callahan Creek, West Fork Pilgrim and White Pine Creek.

The Forest continues to work closely with Montana Fish Wildlife and Parks, Idaho Department of Fish and Game, Avista, and the USFWS to determine distribution and abundance of bull trout within the boundaries of the Kootenai National Forest. This includes yearly surveys to identify the number of redds and spawning adults in several streams across the Forest.Table C-7-3 below shows the number of bull trout redds surveyed in 2006. Redd numbers in Keeler Creek, North Callahan and the Vermilion River were higher than in past years, the remainder of the streams show stable number of redds.

Table C-7-3. 2006 Redd Survey Data.

Stream	Number of Bull Trout Redds
Upper Wigwam	13
Keeler Creek	142
Pipe Creek	6
O'Brien Creek	65
Grave Creek	148
Quartz Creek	51
Bear Creek	14
West Fisher River	4
North Callahan Creek	29
South Callahan Creek	4
Vermilion River	53
Marten Creek	1
Bull River	1
South Fork Bull River	1
East Fork Bull River	19
Swamp Creek	1
Rock Creek	4

Recommended Actions: Based upon the best available information, populations of all threatened or endangered terrestrial species, except grizzly bear, 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. 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 to Forest Plan direction are not needed at this time. It is recommended that the Forest continue to implement recovery actions and actively seek to improve habitat conditions for listed species populations. It is further recommended that the Forest increase information and education efforts related to grizzly bears, especially food attractants. It is also recommended that the Forest increase cooperative efforts with county officials to place bear resistant dumpsters to reduce grizzly bear mortality risks due to food attractants.

Lastly, it is recommended that the Forest continue to implement recovery actions under section 10(a)(1)(A) and actively seek to improve connectivity of bull trout populations.

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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. If the ASQ is not attained, this monitoring item is to explain why. The expected accuracy and reliability of the information are both high.

Background: The ASQ is a projected maximum or ceiling. 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 comprised the total potential timber sale program of 2.3 billion board feet for the decade, or 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 FY88 to approximately 65 MMBF per year in FY05 and 31 MMBF in FY06. For the past 19 years, the average yearly amount sold has been 89.4 MMBF per year. This actual sell volume is below the ASQ limit as set in the Plan.

Evaluation: After 19 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. The average for 1998-2002, the third five-year period, was 60.9 MMBF/year. The last five years has an average of 49.2 MMBF/year.

Many factors have influenced the timber sales program. The U.S. Fish and Wildlife Service amended the biological opinion on the Forest Plan for grizzly bear recovery in July 1995. This and project biological opinions have changed how recovery processes 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 controversy, protection of threatened and endangered species habitat, inability to enter inventoried roadless area, water quality concerns, and reduction in forest budgets.

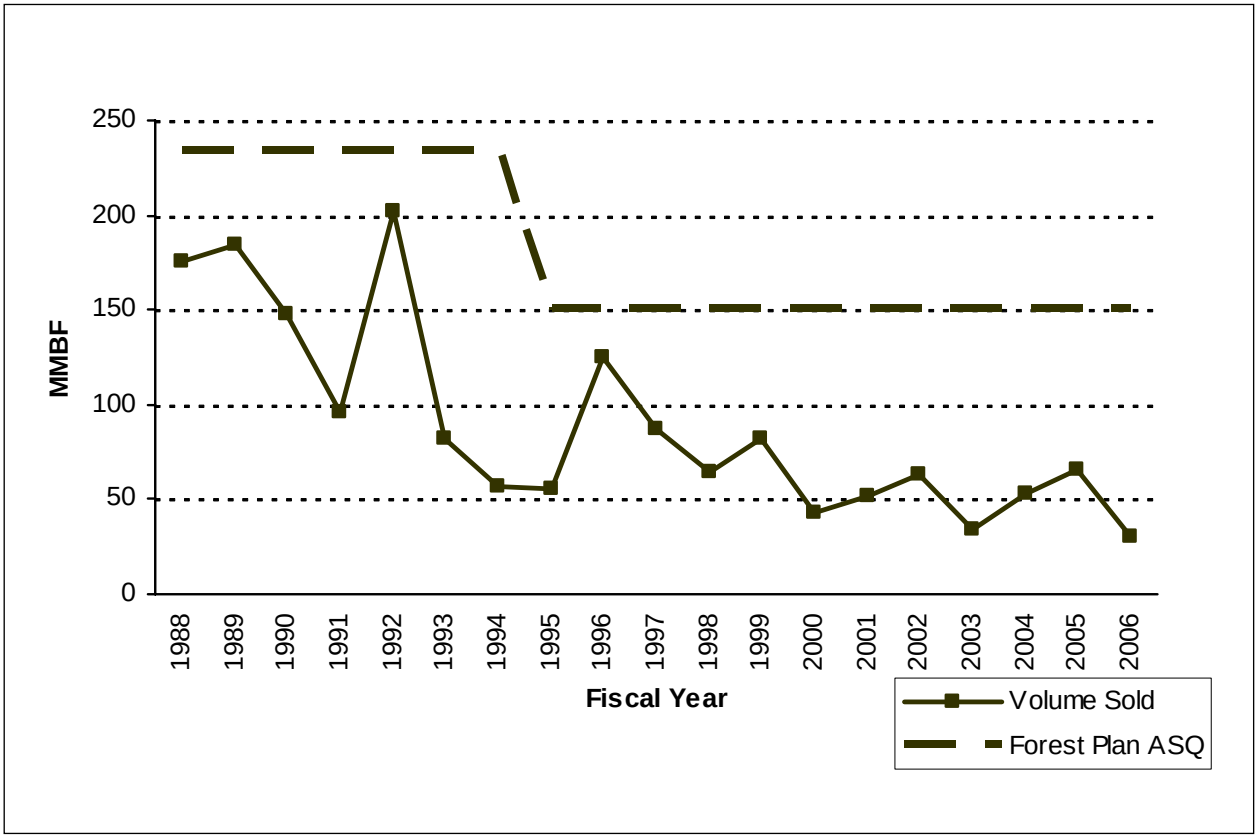
The evaluation limit for this monitoring item is plus or minus 5 percent for suitable volumes and plus or minus 10 percent for unsuitable volumes. These limits have been exceeded, and this indicates that

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 Fiscal Year

Forest Plan Annual ASQ Projection, Adjusted ASQ	Average Sell Volume FY 1988-1992	Average Sell Volume FY 1993-1997	Average Sell Volume FY 1998-2002	FY 2003	FY 2004	FY 2005	FY 2006	Average Sell Volume FY 2002 - 2006	Average Sell Volume FY 1988 - 2006
233 from 1988 – 1994 150 from 1995	161	81.4	60.9	34.0	53.4	65.2	30.6	49.2	89.4

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



Recommended Actions: The Forest has not exceeded the ASQ in 19 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.

FACILITIES: Road Access Management; Monitoring Item L-1

ACTION OR EFFECT TO BE MEASURED:	The miles of road closed.
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 first decade.

Objective: To see if the road closure objectives of the Forest Plan are being met. The Plan requires that this item be reported every five years. The expected accuracy and reliability of the information is high.

Background: Just prior to the time the Plan was approved in September, 1987, about 27 percent of the Nationsal Forest System roads had either yearlong or seasonal prohibitions in effect (Forest Plan FEIS, pave 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 prohibition. This would be about double the miles of road with prohibitions 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 have prohibtions in effect when the timber sales were completed -- the net result being an increase in the number of miles of road with prohibitions but the number of miles of roads without prohibitions would remain the same. The need for additional prohibitions 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 miles of road under prohibitions 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 prohibitions on approximately 57 percent of the Forest's roads (Forest Plan p. II-10) was achieved. By 2002 the percentage of existing roads with either yearlong of seasonal prohibitions reached 63 percent. In 2004 the percentage stablized at 63% and continues to be stable through 2006. Table L-1-1 shows the progression. The roads with prohibitions are both yearlong and seasonal prohibitions. The percentage of roads with prohibitions is 6 percent greater than estimated, and the total amount roads without prohibitions is 1,590 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. Prohititions have been placed on roads that previously had no prohibitions (which were not anticipated to have prohibitions in the Forest Plan) and on newly constructed roads. The reasons for these unanticipated prohibitions include additional wildlife habitat security measures, to decrease potential sedimentation, and to improve hydrological conditions. Table L-1-1 shows the total miles of road increasing by 494 miles between 1997 and 2002 (a 7 percent increase). Only 13.8 miles are from actual new road construction. The balance is a result of a more thorough accounting of previously uninventoried roads.

The trend over the last four years is that the number of roads where motor vehicle use is prohibited, either yearlong or seasonally, has started to level off. This is an indication that the Forest is approaching the necessary level of access management to achieve wildlife and watershed objectives.

Recommended Actions: Continue to monitor the mileage of roads with prohibitions and the reasons for the prohibitions.

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

FY	Total Miles of Road	Total Miles of Road with Prohibitions*	% of Total Roads with Prohibitions	Total Miles of Road without Prohibitions	Difference in Miles of Road without Prohibitions 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)
04	7,916	4,971	63%	2,945	(1,585)
06[1]	7,908	4,968	63%	2940	(1,590)

[1] Data Source: Infra / II_MVUM_ROAD_ALLOW as of 12/13/2006

*National Forest System roads only, where motor vehicle use is prohibited either yearlong or seasonally.