Kootenai National Forest
Forest Plan

Monitoring and Evaluation Report

Fiscal Year 2009

September 2010

United States
Department of Agriculture

Forest Service

USDA United States Department of Agriculture | Forest Service | Kootenai National Forest
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Dear Forest Planning Participant

Enclosed is the Kootenai's Forest Plan Monitoring Report for Fiscal Year (FY) 2009. This report includes information pertaining to six monitoring items as well as Forest Plan amendment information to date. Notification of this report's availability to the public has been made on the Kootenai's Quarterly Schedule of the Proposed Action (SOPA). This report can be found at the following website: http://www.fs.fed.us/r1/kootenai/projects/planning/documents/forest_plan/monitoring/index.shtml.

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

Sincerely,

PAUL BRADFORD
Forest Supervisor

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LIST OF ACRONYMS

AMS	Analysis of the Management Situation
ASQ	Allowable Sale Quantity
AUM	Animal Unit Months
BH	Breast Height
BMU	Bear Management Unit
BORZ	Bears Outside the Recovery Zone
BY	Bear Year (April 1 to November 15 (IGBC))
CYE	Cabinet Yaak Ecosystem
DBH	Diameter Breast Height
EA	Environmental Assessment
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FIA	Forest Inventory and Analysis
FP	Forest Plan
FSH	Forest Service Handbook
FSM	Forest Service Manual
FWS	Fish and Wildlife Service
FY	Fiscal Year
GIS	Geographic Information System
HE	Habitat Effectiveness
IDFG	Idaho Department of Fish and Game
IGBC	Interagency Grizzly Bear Committee
INFS	Inland Native Fish Strategy
KNF	Kootenai National Forest
LAU	Lynx Analysis Units
MA	Management Area
MDFWP	Montana Department of Fish, Wildlife and Parks
MMBF	Million Board Feet
NCDE	Northern Continental Divide Ecosystem
NEPA	National Environmental Protection Agency
OMRD	Open Motorized Route Density
ORD	Open Road Density
ORV	Off-road Vehicle
T&E	Threatened and Endangered
TMRD	Total Motorized Route Density
TPA	Trees per Acre
TRD	Total Road Density

Kootenai National Forest

Monitoring and Evaluation Report, Fiscal Year 2009

INTRODUCTION

The Kootenai Forest Plan was approved on September 14, 1987. It established management direction that became effective 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 over twenty 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 developed an Analysis of the Management Situation (AMS) in March of 2003. This AMS served as our five year monitoring summary and presented valuable monitoring and evaluation information which was used to assist us in identifying changes for Forest Plan revision.

Over the last twenty-plus years our Monitoring and Evaluation program has shown that 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.

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 within each of the drainages).

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Reduction below 10 percent in the drainages which was previously over minimum or any reduction in each of the drainages 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 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 of the drainages.

Kootenai Supplement (Supplement 85, 1991) to Forest Service Manual (FSM) 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.
2) GIS layer of stands designated or undesignated effective old growth or replacement old growth.

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

The 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 Geographic Information System (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 disturbances 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 percent of plots every year, with 60 percent of the forest re-measured at this time.

2) Stand-level map of old growth

The KNF continues to use a 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 21 years (1989-2009). 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 percent 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 KNF is 9 percent with a 90 percent confidence interval of 7.2 percent to 10.9 percent.

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 5,500 feet in elevation. As of September 2009, the stand level inventory indicates a total of 298,341 (16 percent) of National Forest lands below 5,500 feet in elevation are either effective or replacement old growth. Approximately 10.8 percent (201,472 acres) of those lands were determined to be effective old growth and an additional 5.2 percent (96,876 acres) identified as replacement old growth.

Comparison: 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 percent of the forest with a 90percent confidence interval of 7.2 percent to 10.9 percent. The acres of effective (existing) old growth in the stand-level GIS layer total to 10.8 percent of forested lands less than 5500 feet in elevation. Although the FIA data shows less old growth at the mean (9.0 percent) than the stand level map (10.8 percent), the stand level map results are within the 90 percent 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 <5,500 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 percent of the forest as old growth habitat well distributed across KNF lands below 5,500 feet elevation.

Recommended Actions: Project level analyses will continue to use the FIA forest data and the stand-level GIS layer in their project level assessments. Revision of the forest plan will address how to manage old growth into the future.

Table C-5-1 Stand Level Old Growth Summary

Oldgrowth updated August 2009
10/1/2009

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 as pi)	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	245,629	22,815	338	4,652	275	14,710	796	6,634	38,370	15.62%	11,286	49,656	20.2%	28,080	11.4%
D3	183,772	17,924	2,362	1,252	1,384	17,089	1,594	0	38,217	20.80%	1,252	39,469	21.5%	22,922	12.5%
D4	504,317	38,128	2,372	16,036	1,469	4,101	3,924	3,491	46,888	9.30%	19,527	66,415	13.2%	58,005	11.5%
D5	557,323	47,174	2,722	24,062	293	2,930	2,730	6,258	53,551	9.61%	30,320	83,871	15.0%	74,251	13.3%
D7	378,181	5,402	2,736	17,943	16,817	752	10,933	16,548	24,446	6.46%	34,491	58,937	15.6%	42,898	11.3%
Forest Total	1,869,222	131,443	10,530	63,945	20,238	39,582	19,977	32,931	201,472	10.78%	96,876	298,348	16.0%	226,156	12.1%

** 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 5500'.

/fsfiles/office/planning/19_planning/og_perm_files/

Figure C-5-1 Old Growth by Type

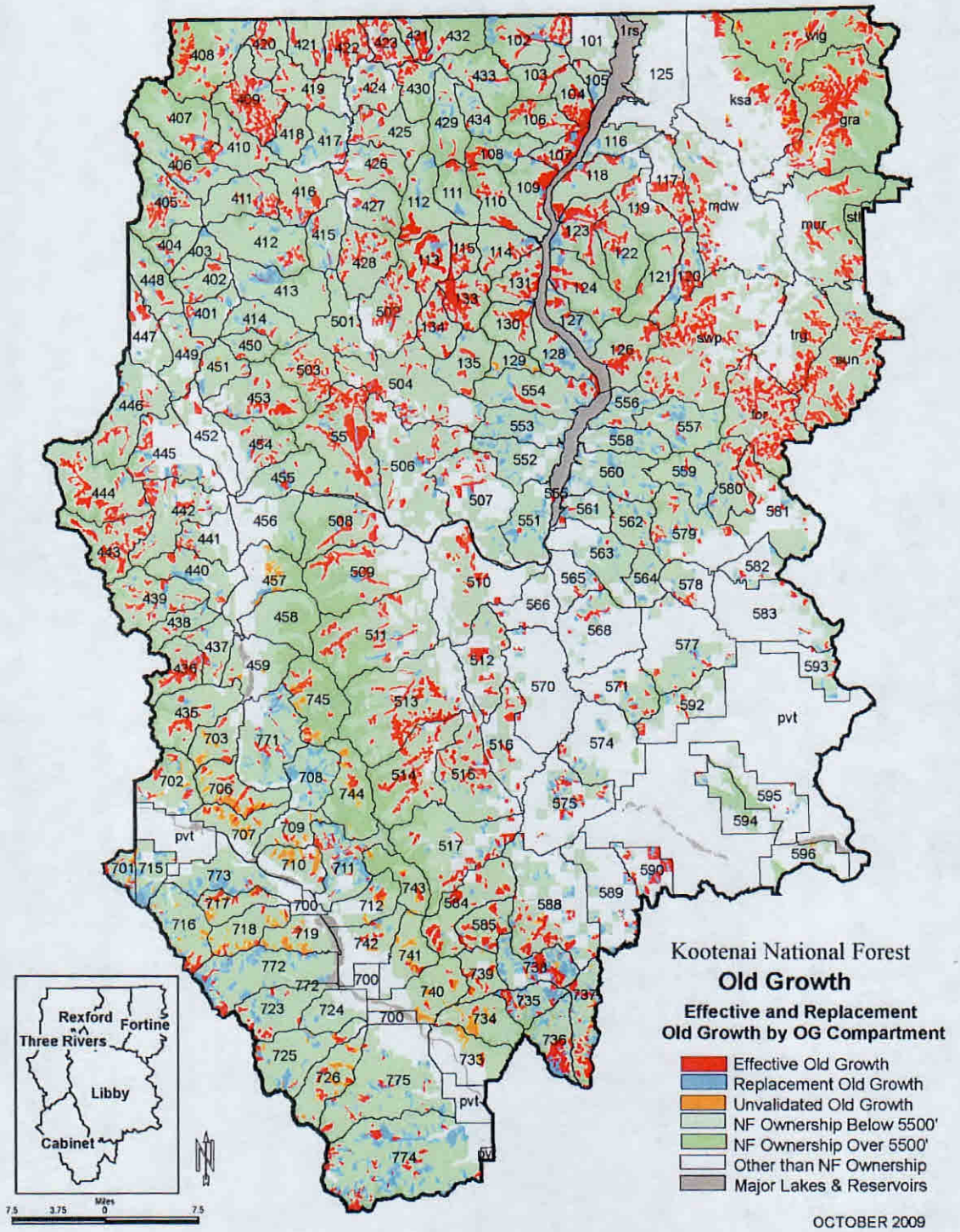
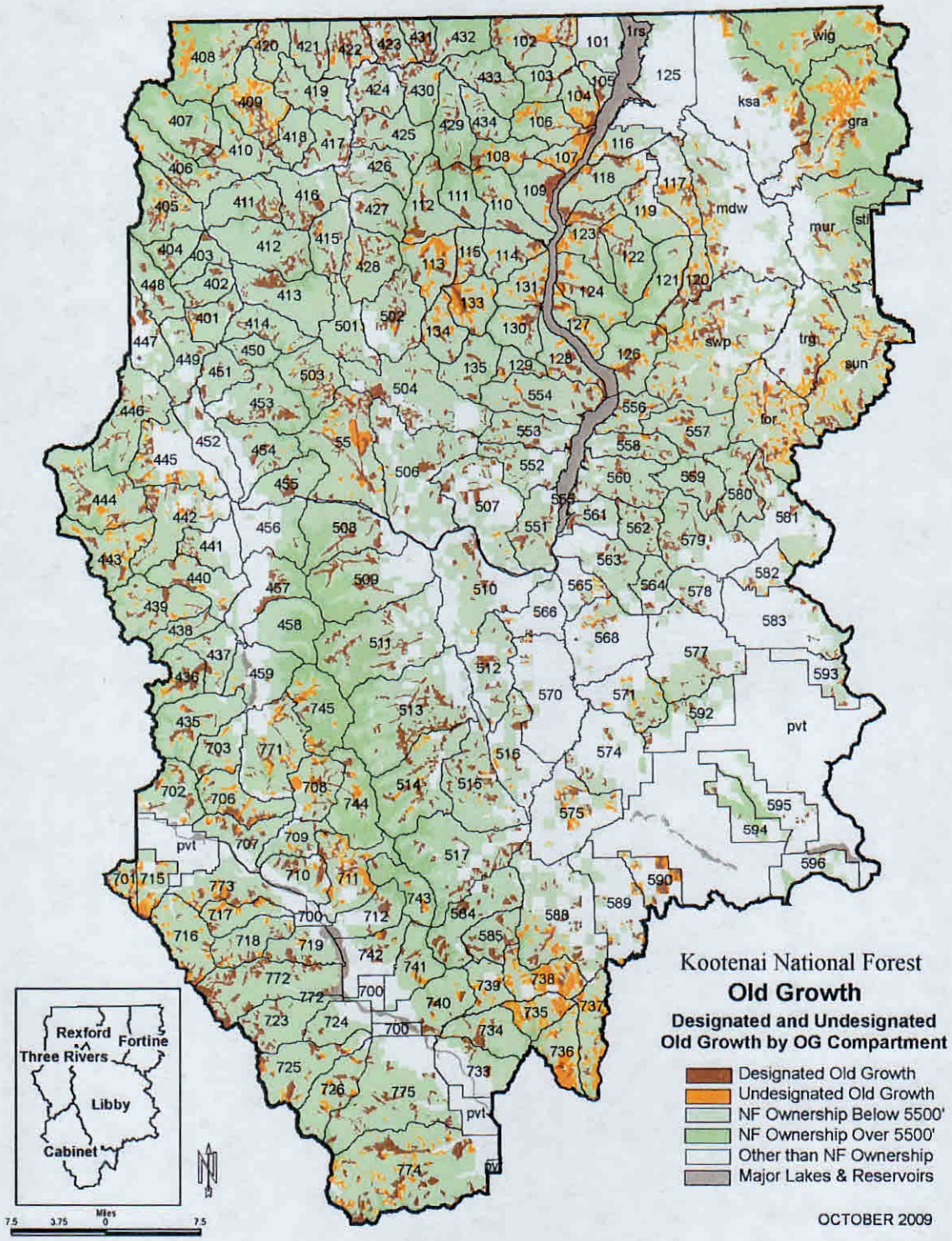


Figure C-5-2 Designated and Undesignated Old Growth



Additional Information:

There are no Forest Plan standards that establish a minimum unit size for old growth, but management recommendations for old growth habitat found in Appendix 17 of the Kootenai Forest Plan describe goals to strive for in the distribution and amount of old growth.

Although, the Forest Plan states that "efforts should be made to provide old growth habitat in blocks of 100 acres or larger," it was recognized that situations such as past fires or management activities might limit remaining old growth blocks in an area to less than 50 acres in size. While these may still provide useful old growth habitat, the recommendation in Appendix 17 of the plan is that unit sizes of "50 acres or less should be the exception rather than the rule,"

The stand-level map of old growth was used to analyze the size of old growth blocks on the Forest. Table C-5-2 displays the number of blocks of old growth by acre size category. The table also displays the total acres within an acre category. The table indicates the size category with the greatest number of polygons is in the less than 50 acre size. However, the total acres associated with the less than 50 acre block size is less than 7 percent of the total effective old growth and less than 17 percent of the replacement old growth. When effective and replacement old growth are combined, it is less than 6 percent of the old growth.

Table C-5-2 Size of Old Growth Blocks (10/1/08)

	Effective Old Growth		Replacement Old Growth		All Old Growth	
Block Size	Number of Blocks	Acres	Number of Blocks	Acres	Number of Blocks	Acres
<50	616	16,803	742	17,510	718	20,488
>=50 and <100	340	24,588	282	20,026	432	31,381
>=100 and <300	377	64,193	213	35,760	475	82,019
>=300	163	128,678	57	31,282	244	204,945
Totals	1,496	234,262	1,294	104,578	1,869	338,833

The acres shown in Table C-5-2 are approximately 40,000 acres more than shown in Table C-5-1. Table C-5-2 includes all polygons identified as old growth, including approximately 19,000 acres of old growth over 5,500 foot elevation. This table also includes all of the polygons that were photo-interpreted. The acres in Table C-5-1 are for lands less than 5,500 foot elevation and include only 60 percent of stands photo-interpreted (reducing effective old growth by approximately 20,000 acres).

These figures do not reflect the fact that most blocks are connected on one or more sides directly to larger blocks of forest that are equal to or greater than 50 years old. This means that they are not isolated, but connected to additional habitat. Although some blocks are under 50 acres in size these stands were retained due to their old growth characteristics, their contribution to the overall continuity or connectivity of existing old growth stands within the compartment, or their potential to develop into higher quality old growth.

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

[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.*

between the old-growth definition of tree age and FIA field measurement protocols. 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

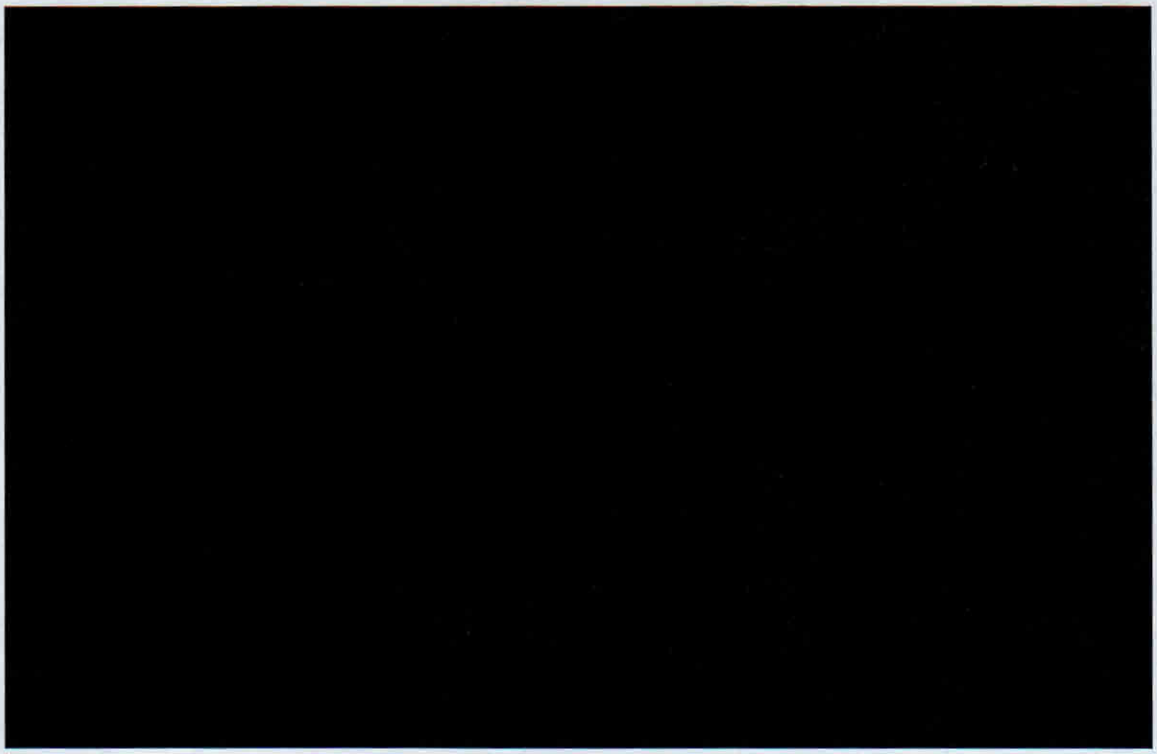
Using FIA data, the same methodology can also be used to estimate the percent old growth on medium to large geographic areas, landscapes, or watersheds within individual National Forests. Estimates of old growth across these areas provide a means for examining the distribution of old growth within a 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.



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WILDLIFE & FISHERIES: Threatened and Endangered Species; Monitoring 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, Grizzly Bear, Bull Trout, and White Sturgeon.
VARIABILTY 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 2007. The expected precision and reliability of the information is high and moderate, respectively.

Evaluation:

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 Mountain 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 (FWS 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.

Sightings of females with cubs-of-the-year, distribution of females with young and human-caused female mortalities do not yet meet recovery goals for the CYE. With the exception of human caused female mortalities recovery goals are met in the NCDE.

The following is a discussion of the forests contribution toward meeting the recovery plan goals.

Unduplicated Sightings of Females with Cubs: In 2009, there were two credible sightings of unduplicated female grizzly bears with cubs-of-the-year in

the Kootenai portion of the CYE (personal communication: Kasworm August 2010), and one in the KNF portion of the NCDE.

Distribution of Females with Young: Two of the 17 BMUs on the Kootenai portion of the CYE were occupied by females with young in 2009. The total number of different BMUs occupied over the entire recovery zone during the past seven years was eleven, compared to the Recovery Plan goal of eighteen (personal communication: Wayne Kasworm, August 2010). The one BMU in the Kootenai's portion of the NCDE was occupied by a female with young during the year.

Mortality: There was one, human-caused mortality in the CYE. A female bear was killed in self defense in the East Fork Bull River, MT. There were no mortalities in the Kootenai portion of the NCDE

Table C-7-1. Grizzly bear females with cubs, distribution of females with young and human-caused mortality.

Bear Year (BY)	NCDE (KNF Portion only)			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 female Mortalities
2003	0	0	1	2	7	0
2004	4	1	1	1	5	0
2005	2	1	0	1	3	2
2006	0	1	1	1	3	0
2007	2	1	1	4	8	1
2008	1	1	0	2	2	0
2009	**	**	0	2	6	1
7-yr Average	-	-	0.7	1.9	4.9	0.6

*** Note: 12 different BMUs were known to be used by females with young over the past 6 years.**

**** This item is no longer tracked as recent DNA research has made it possible to estimate the population of grizzly bears in the NCDE at 765 bears (11/20/08 Servheen memo).**

With the District court decision (12/13/2006) to set aside the Forest Plan Access amendment, habitat criteria for linear open road density and percent habitat effectiveness once again are reported. The linear open road density criterion is < 0.75 miles per square mile for each BMU. Fifteen of the 17 BMUs on the KNF meet this criterion. The habitat effectiveness criterion is > 70 percent. Twelve of the 17 BMUs on the KNF meet this criterion.

Applying best science (Wakkinen and Kasworm 1997) has established additional access management consideration in assessing grizzly bear habitat in the CYE. Identified monitoring parameters include Open Motorized Route Density (OMRD)[1], Total Motorized Route Density (TMRD)[2] and core.

Tables C-7-2A, B, and C display Core (see Figure C-7-1), OMRD, and TMRD values by BMU for bear years (BY) 2000 through 2009. Changes in core, OMRD and TMRD in FY09 are the result of management activities, activities on private land, and field verified corrections in road status from bear year 2006.

[1] OMRD = Calculation made with the moving windows technique that includes open roads, other roads not meeting gated or impassible criteria, and open motorized trails. Density is displayed as a percentage of the analysis area in a defined density category (IGBC 1998)

[2] TMRD = Calculation made with the moving windows technique that includes open roads, restricted roads, roads not meeting all impassible criteria, and open motorized trails. Density is displayed as a percentage of the analysis area in a defined density category. Example: 20 percent great than 2.0 miles of road per square mile of habitat (IGBC 1998).

Table C-7-2A. Bear Year (BY) (4/1 through 11/30) percent core for the CYE and NCDE by BMU.

BMU	BY00 %	BY01 %	BY02 %	BY03 %	BY04 %	BY05 %	BY06 %	BY07 %	BY08 %	BY09 %
Cabinet Yaak										
Cedar	83	83	83	83	84	85	85	83	83	83
Snowshoe	78	77	77	78	78	77	76	76	76	76
Spar	58	64	62	62	63	63	62	60	60	62
Bull	63	63	62	62	63	63	63	62	63	62
Saint Paul	62	62	63	60	60	59	60	58	59	58
Wanless	53	55	55	54	56	54	54	53	54	54
SilverButte/Fisher	66	66	66	66	66	67	67	62	63	62
Vermillion	57	56	56	56	56	56	56	54	55	55
Callahan	56	57	57	59	60	59	58	58	59	59
Pulpit	48	49	49	52	52	51	51	52	52	52
Roderick	55	54	54	53	53	53	52	52	54	54
Newton	56	57	57	56	56	56	56	56	57	58
Keno	59	62	62	61	61	61	59	59	59	59
NW Peak	56	56	56	57	57	56	55	55	56	56
Garver	48	47	50	50	48*	46	45	46	54	55
E F Yaak	45	45	45	59	55	54	53	53	54	54
Big Creek	49	50	50	50	50	49	54	55	59	58
Average	58	59	59	59	60	59	59	58	60	60
Northern Continental Divide										
Murphy Lk	70	70	72	72	72	72	72	72	72	73

Highlighted value does not meet the ≥ average 55 % level identified by research (Wakkinen and Kasworm 1997).

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

Table C-7-2B. Bear Year (BY) (4/1 through 11/30) OMRD conditions (% BMU > 1 mi/mi²) for the CYE and NCDE by BMU.

BMU	BY00 %	BY01 %	BY02 %	BY03 %	BY04 %	BY05 %	BY06 %	BY07 %	BY08 %	BY09 %
Cabinet Yaak										
Cedar	12	12	12	12	13	14	12	12	14	14
Snowshoe	17	17	17	17	17	19	20	19	19	20
Spar	24	26	27	24	25	26	27	27	27	27
Bull	36	36	36	36	37	37	36	37	37	37
Saint Paul	27	27	26	27	26	27	27	28	28	28
Wanless	34	34	33	37	33	35	35	32	30	29
SilverButte/Fisher	23	23	23	23	23	24	23	25	27	32
Vermillion	32	32	32	32	32	32	32	33	33	33
Callahan	32	32	32	26	26	28	28	27	27	27
Pulpit	45	41	41	41	41	42	41	44	44	44
Roderick	29	29	31	30	29	28	28	28	28	28
Newton	45	43	43	41	41	42	42	42	42	42
Keno	34	33	28	33	33	34	34	34	34	34
NW Peak	28	35	28	27	28	28	28	28	28	28
Garver	31	31	31	31	29	33	30	30	29	29
E F Yaak	31	28	29	28	31	28	28	29	31	29
Big Creek	32	32	31	31	31	29	31	30	30	30
Average	28	30	31	31	31	30	30	30	30	30
Northern Continental Divide										
Murphy Lk	20	20	19	19	20	20	20	20	20	20

Highlighted value does not meet the ≤ average 33 % level identified by research (Wakkinen and Kasworm 1997).

Table C-7-2C. Bear Year (BY) (4/1 through 11/30) TMRD conditions (% BMU > 2 mi/mi²) for the CYE and NCDE by BMU.

BMU	BY00 %	BY01 %	BY02 %	BY03 %	BY04 %	BY05 %	BY06 %	BY07 %	BY08 %	BY09 %
Cabinet Yaak										
Cedar	11	11	10	11	10	8	8	9	9	10
Snowshoe	14	14	14	14	14	14	15	16	15	16
Spar	30	27	26	26	24	24	24	27	27	26
Bull	26	26	26	26	26	26	26	26	26	29
Saint Paul	21	21	21	21	21	24	23	23	24	23
Wanless	33	32	32	32	31	31	33	33	33	34
SilverButte/Fisher	20	20	20	20	21	20	21	23	23	23
Vermillion	21	23	23	23	23	23	23	24	22	24
Callahan	28	27	27	26	26	26	26	26	26	26
Pulpit	34	32	32	30	31	29	28	28	28	29
Roderick	27	28	28	28	29	29	28	29	28	28
Newton	31	29	30	31	31	31	30	31	30	29
Keno	24	24	24	24	23	24	25	25	25	25
NW Peak	26	26	26	25	26	26	26	26	26	26
Garver	32	32	30	29	29	34	33	32	25	25
E F Yaak	38	38	38	30	25	26	26	27	27	27
Big Creek	27	26	26	25	25	25	20	18	15	16
Average	26	26	24	25	24	25	23	25	26	25
Northern Continental Divide										
Murphy Lk	12	12	6	6	6	6	6	6	6	11

Highlighted value does not meet the ≤ average 26 % level identified by research (Wakkinen and Kasworm 1997).

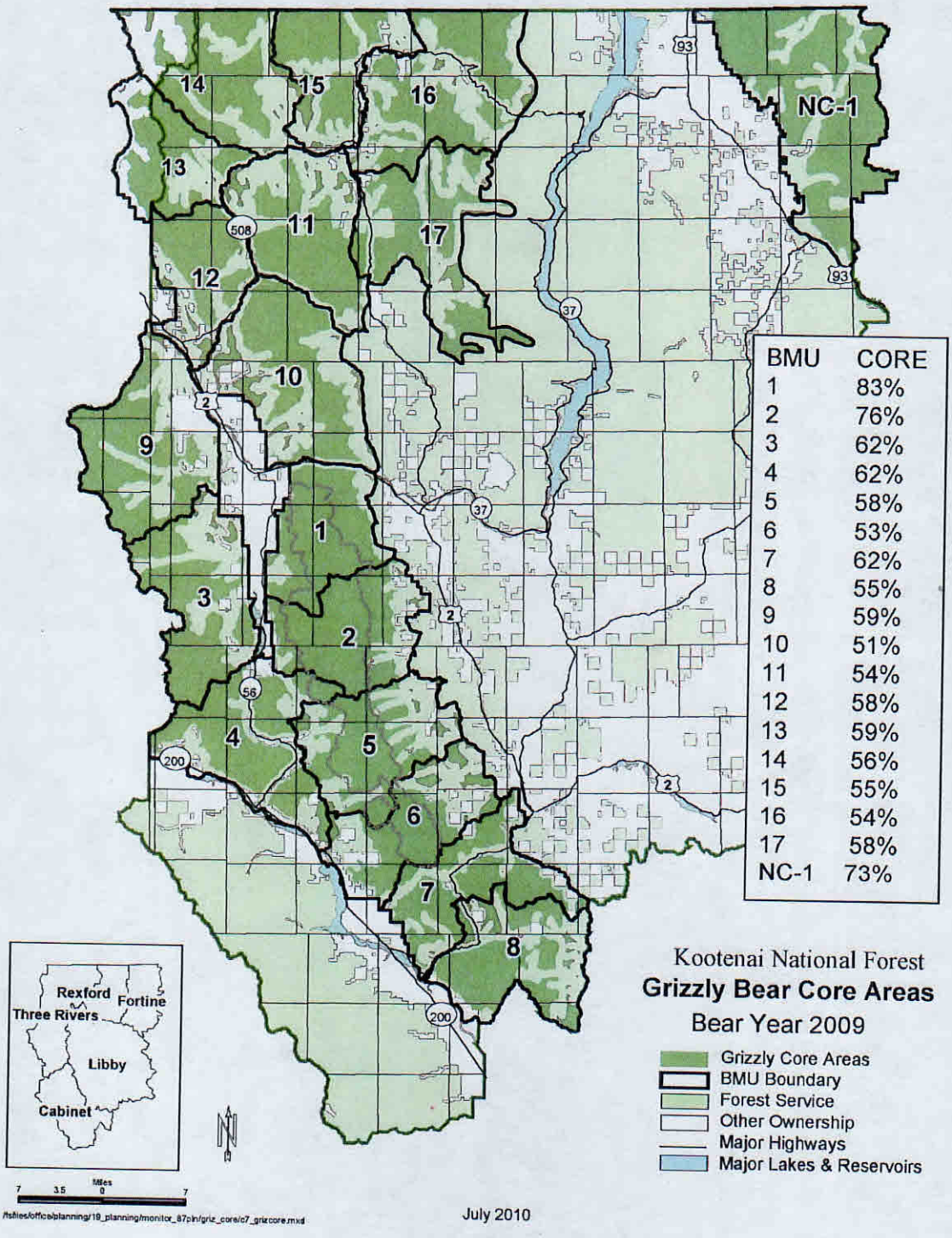


Figure C-7-1. Grizzly Bear Core Areas.

Bears outside the Recovery Zone (BORZ): In addition to the monitoring items inside the recovery zone, criteria for areas outside the recovery zones that are occupied by grizzly bear are also monitored to assure compliance with ESA. The criteria for bears outside the recovery zone (BORZ) polygons are:

- No increases in linear open road density above baseline conditions.
- No permanent increases in linear total road densities above baseline conditions.

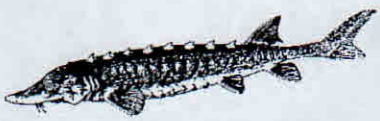
Table C-7-3 shows the baseline conditions established as of 2003 and corrected in 2005 and reports this year's status.

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

BORZ Polygon	Baseline linear open road density	FY04	FY05	FY08	FY09	Baseline linear total road density	FY04	FY05	FY08	FY09
Cabinet Face	2.2	2.2	2.2	2.2	2.2	3.9	3.9	3.9	3.9	3.9
Clark Fork	0.9	0.9	0.9	0.9	0.9	2.6	2.6	2.6	2.6	2.4
Tobacco	2.0	1.8	2.0	2.0	2.0	3.0	3.3	3.0	3.0	3.0
Troy	1.2	1.1	1.1	1.9	1.1	2.6	2.5	2.5	2.9	2.5
West Kootenai	1.3	1.3	1.3	1.3	1.3	3.0	3.0	3.0	3.0	3.0
Fisher	1.0	1.0	1.0	1.0	1.0	2.7	2.7	2.7	2.7	2.7
Libby	1.9	1.9	1.9	1.9	1.9	3.4	3.4	3.4	3.4	3.4

Summary within the recovery area the Kootenai portion of the CYE: Sightings of female grizzly bears with cubs of the year in FY09 were the same from FY08. Females with young occupied 6 BMUs, three times more than in the previous year. There was one, human-caused female grizzly mortality in 2009. Overall, open route densities remained the same and total route densities decreased during the year. The amount of total core area in grizzly habitat was unchanged from last year. The grizzly bear population trend in the CYE has about a 94 percent probability that it is declining (Kasworm et. al. 2007).

Lynx – The Canada lynx was listed as threatened in March, 2000. The KNF currently manages for lynx habitat using the Northern Rockies Lynx Management Direction (McAllister et. al. 2007). The Forest delineated 47 Lynx Analysis Units (LAUs) which approximate a lynx home range size. At the end of 2009 three of the 47 lynx analysis units had more than 30 percent of the lynx habitat in the stand initiation structural stage. All LAUs had $\leq$ 15 percent changed to unsuitable condition in the last 10 years and none of the LAUs had more than 1 adjacent LAU that exceeded the 30 percent in the stand initiation stage. Management for lynx of the forest meets the Northern Rockies Lynx Management Direction.



White Sturgeon – The 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 Recovery Plan.

Recovery of white sturgeon is managed by the IDFG, Kootenai Tribe of Idaho, and the MDFWP. 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 KNF. 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 FWS on all proposed or authorized activities. All proposed projects and activities evaluated by the Forest in FY 09 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 (FWS 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). 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 nine months of age at release) consistently exhibit successful growth, and second year survival rates exceed 90 percent (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 IDFG indicates there are approximately 450 adult sturgeons in the population (Paragamian et al. 2005).

Bull trout -- The KNF continues to consult with the FWS 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 FWS to implement Programmatic Biological Assessments and maintain consistency for consultation standards.

There was one project submitted for formal consultation with the FWS in FY 2009. The determination of the biological assessments was: May affect, likely to adversely affect bull trout. The project included timber harvest and channel stabilization associated with an existing sediment source that impacts bull trout spawning habitat on the Fisher River.

The forest also implemented Phase III of the Pipe Creek Bull Trout Habitat Enhancement Project. This work has been done in partnership with the FWS and MDFWP over the past 8 years in an effort to increase the number of bull trout in Pipe Creek. This project removed a debris jam which was a migration barrier and created six large pools for security and rearing habitat. This year Pipe Creek had four redds.

The Forest continues to work closely with MDFWP, IDFG, Avista, and the FWS to determine distribution and abundance of bull trout within the boundaries of the KNF. This includes yearly surveys to identify the number of redds and spawning adults in several streams across the Forest. Table C-7-4, below, shows the number of bull trout redds surveyed in 2009. Redd numbers in Kootenai tributaries were down from previous years, whereas the Clark Fork River tributaries showed a general increase in redd numbers. The Vermilion River was double the 2008 redd count.

Table C-7-4. Bull trout redd survey summary for all index tributaries in the Kootenai and Clark Fork River Basins, MT 2009

Stream	Number of Redds	Miles Surveyed
Kootenai River Tributaries		
Grave Creek – includes (Clarence) and (Blue Sky) Creeks	131 (24) (8)	9
Quartz Creek – includes (West Fork)	31 (13)	10.0
O'Brien Creek	40	5.3
Pipe Creek	9	8.0
Bear	6	4.25
Keeler – includes (North Fork) and (South Fork)	24 (0) (0)	8.9
Wigwam – includes (Bighorn, Desolation, Lodgepole – U.S.)	1575 (8)	22
Other B.C.- includes (Skookumchuk) (White) (Blackfoot)	236 (64 (172) (na)	15
West Fisher (U.S.F.S and F.W.P.)	8	6
Callahan Creek (MFWP) includes (North Callahan) and (South Callahan)	10 (10) (0)	5
Clark Fork Tributaries		
Bull River	0	na
South Fork Bull River	0	na
East Fork Bull River	15	na
Rock Creek	6	na
Swamp Creek	0	na
Marten Creek	4	na
Vermilion River	31	na
Graves Creek	8	na
Prospect Creek	7	na

Recommendations

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 was removed from the threatened and endangered list in August 2007. All of the threatened and endangered species' habitats being monitored appear to be maintaining or improving. Information shows that the KNF 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. The Region has identified emphasis areas in a bull trout conservation strategy. They include the Vermilion River on the lower Clark Fork. It is recommended that the forest pursue restoration activities in the Vermilion River.

Range: Monitoring Item D-1

ACTION OR EFFECT TO BE MEASURED Determine if the grazing use measured in Animal Unit Months (AUMs) meets Forest Plan Projections

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: +/- 20 percent of anticipated AUMs.

Purpose: This monitoring item was established to track grazing use on the Forest. The Forest Plan requires that this item be reported annually. The expected accuracy and reliability of the information are both high.

Background: Livestock use on the Kootenai was anticipated to be about 12,600 AUMs per year. At the time the Plan was approved, there were 41 (total of 45) active allotments located mostly in the northeastern portion of the Forest on the Rexford and Fortine Ranger Districts. Currently, the Forest has 43 grazing allotments, of which 13 are active and 30 are vacant. The allotments have a ten-year permit period. All of the active allotments have had National Environmental Policy Act (NEPA) analysis completed and Management Plans written and updated since 1996. The Swamp Creek allotment no longer exists because it was part of a land exchange.

Results: In FY09 there were 4,713 AUMs on the KNF (see Table D-1-1). This is 37 percent of the projected level of available use. Monitoring indicates that riparian protection measures identified in the new grazing permits are being implemented.

Table D-1-1 Range Use in AUMs

Item	Forest Plan Projected Use	FY09 Use	10-year Average
AUMs	12,600	4,713	5,092
Percent	100	37	40

Evaluation: During the last 10 years, grazing use has averaged 40 percent of projected use, which is well below the use anticipated in the Plan. Many of the original allotments (26) consisted of transitory range which has filled in with trees and/or the allotments were located in the bottom of riparian areas; for these reasons 26 allotments are now being targeted for closing. Annual use is lower than projected in the Forest Plan due to reductions in grazing operations and permittees going out of the cattle business. Also, all allotments are transitory range. As tree cover becomes greater less sunlight is available for grass growth, which means less forage is available. Much of the grazing in many of the allotments occurs on the roadside vegetation. Some of the problems in a transitory-range area include cattle congregating in openings and in riparian areas, which in effect become "sacrifice" areas. Also, these openings and riparian areas "convert" to Kentucky bluegrass sites, which continually attract animals. On transitory range it is very difficult to move and/or to keep animals spread over the entire allotment. There has been a downward trend in AUMs since 1995. The main reasons are market, greater recognition of protecting riparian areas, societal changes-only one full-time rancher in the Tobacco Valley area, and less transitory range. Ten term permits were waived back to the government over the last ten years. Two temporary permits were issued in 2009.

Recommended Action: In review of this monitoring item, many of the allotments that were active at the initiation of the Forest Plan are no longer active (reasons stated above). It is recommended that these inactive allotments be terminated. These allotments are: Mud Griffith Creeks, Upper Grave Creek, Seventeen Mile, South Fork, Upper Ford, Yaak River, Bobtail, Elliot Cowell, Granite-Cherry, Jumbo-Bayhorse, Libby Creek, McMillan, Barron, Quartz, Prospect, Schrieber, Sheldon Mountain, Surprise, Swede Mountain, West Fisher, Canyon, Cripple Horse, Marten Creek, Big Beaver, Green Mountain, and Tuscor Creek. For the active allotments no change is needed. Numbers will remain lower than Projected Forest Plan Use, again for the reasons stated above. Range use will be looked at in Forest Plan Revision.

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 FY 88 to approximately 65 MMBF per year in FY05 and 47 MMBF in FY09. For the past 22 years, the average yearly amount sold has been 83.1 MMBF per year. This actual sell volume is well below the ASQ limit as set in the Plan.

Evaluation: After 22 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 45.0 MMBF/year.

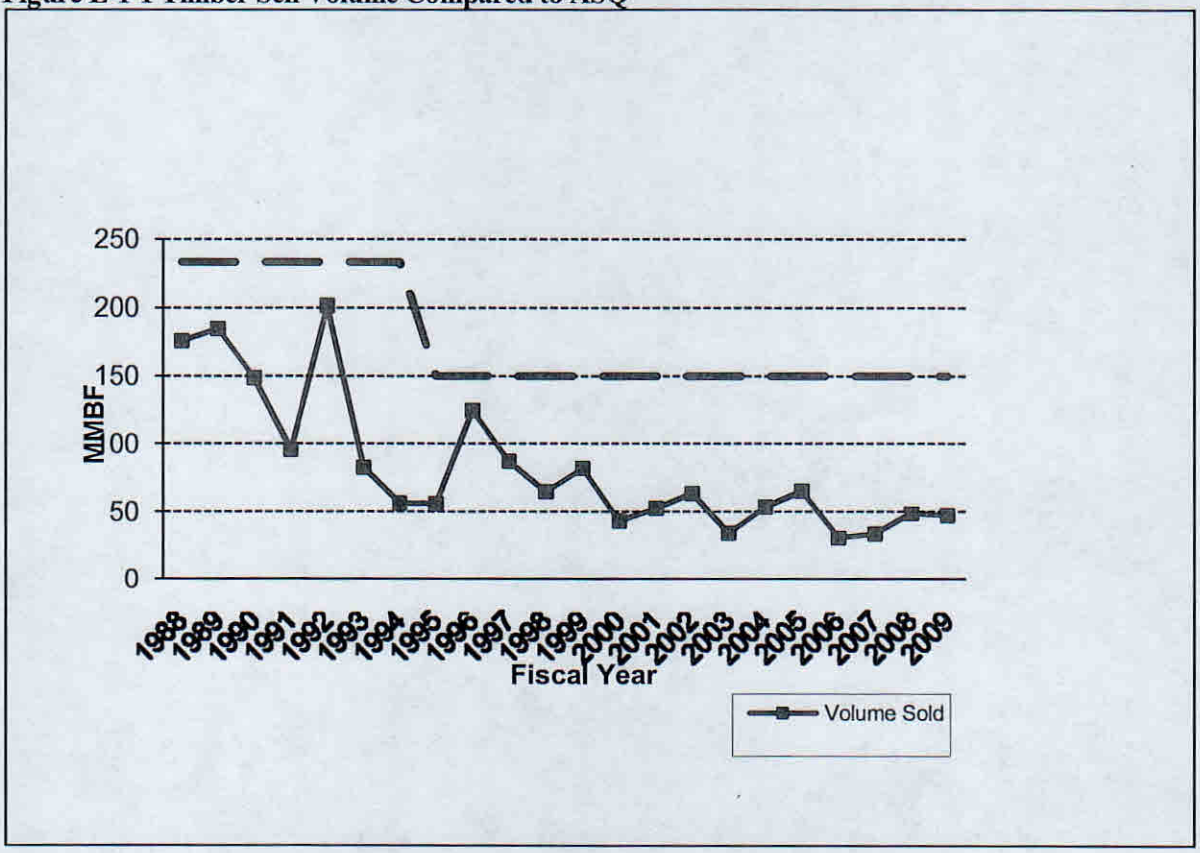
Many factors have influenced the timber sale program. The FWS amended the biological opinion for grizzly bear recovery in July 1995 and changed how recovery processes would take place on the Forest. The Inland Native Fish Strategy (INFS) Decision of July 1995 resulted in additional streamside protection 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 areas, 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 FY88-92	Average Sell Volume FY93-97	Average Sell Volume FY98-02	Average Sell Volume FY02-07	FY2008	FY2009	Average Sell Volume FY1988-2009
233 from 1988-1994, 150 from 1995	161	81.4	60.9	43.4	48.4	47.1	83.1

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



Recommended Actions: The Forest has not exceeded the ASQ in 22 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.

SOIL and WATER: Monitoring Item F-4

ACTION OR EFFECT TO BE MEASURED: Determine the changes in site quality due to surface displacement and soil compaction.

VARIABILTY 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 which 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 1 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 KNF uses the 15 percent detrimental disturbance as a measure to track the impact on site productivity. If 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 prior to 2007 was done within activity areas using **line transect** and **walk-through** methods (patterned after Howes et al. 1983). The *line transect* was performed perpendicular to the direction of the ground-disturbing activity and involved from one to five transects within each activity area. Steps along each transect represented a monitoring point. Both quantitative and qualitative descriptions were provided. The *walk-through* method involved walking through the unit and providing a qualitative description of the soil impacts. Each transect represented the various activities that occurred within that portion of the activity area. The monitoring was representative of the variety of timber harvesting techniques that occurred on the KNF. 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.

In 2007, under Regional Forester direction, the KNF along with other forests in Region 1 began using the draft Northern Region Soil Disturbance Monitoring Protocol (2007). This methodology is similar to what had been used on the KNF for the previous 19 years; however, the two data sets

are not statistically comparable, so for the purposes of the Forest Plan Monitoring Report the respective results for the two methodologies are reported separately. The new methodology requires determining soil disturbance at one of four levels along a random transect. Transects are monumented for future use and a minimum of 30 points are randomly collected equidistant within the activity area along a randomly selected transect. The goal of such data collection process is to obtain a representative estimate of the amount and types of management-caused disturbance. When sampling is chosen randomly and "large enough," it can be considered representative of the activity area, as a whole.

The following forest level soil monitoring questions are part of the Region 1 monitoring strategy:

- What are conditions and trends of soil quality for the project area? How do these conditions compare to desired conditions and objectives and is there a need to change the Plan or management actions?
    - Measurement: Acres in detrimental soil conditions reported as a percentage of total treatment area acres (forested).
- How are management actions maintaining soil quality?
    - Measurement: 1) Implementation of protective measures, e.g. design criteria, mitigation measures-verifying that we did what we said we would do (compliance with Plan and Environmental Management System (EMS); and 2) Effectiveness of the protective measures.

Results. Table F-4-4a summarizes the amount and type of harvest monitoring completed from 1988-2006. Between 1988 and 2006 surveys were completed on 462 (231 transects and 231 walk-through) timber harvest units scattered across the forest. These areas represent the current logging methods including the types of equipment being used for mechanical falling, skidding, yarding, and slash piling. The areas reviewed ranged in size from two to 226 acres. Surveys have been completed by two methods: transect and walk-through. Table F-4-4b summarizes the amount and type of harvest monitoring completed between 2007 and 2009. Monitoring surveys have been completed on 108 (108 transects and 0 walk-through) timber harvest units scattered across the forest in that time frame. Similar to 1988-2006 the areas monitored represent the current logging methods including the types of equipment being used for mechanical falling, skidding, yarding, and slash piling. The areas reviewed ranged in size from 5 to 186 acres. Surveys have been completed using the Northern Region Soil Disturbance Monitoring Protocol.

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, 14,584 acres have been surveyed and less than 0.2 percent (29 acres) was above the Forest Plan limits. Similarly, in the last five year reporting period there were four units that exceeded the 15 percent detrimental disturbance (see **Table F-4-3a**). Table **F-4-3b** shows the acres determined to exceed the 15 percent detrimental disturbance criteria. For the five year period (2005-2009) 5,792 acres (regeneration or intermediate harvest) were monitored. Table **F-4-1** displays the types of timber sales monitored from 1988-2009. Table **F-4-2** displays the number of units by harvest types monitored from 1988-2009. 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 or where very moist soils were present resulted in a higher level of detrimental disturbance, however, 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 by year.

Sales Type	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09
Regular	2	2	1	3	10	9	3	7	8	5	12	4	3	3	20	5	5	6	10	11	13	18
Pest Control	2	3	1	2	4	3	0	0	8	7	7	14	2	1	2	1	0	0	0	1	0	0
Fire Salvage	0	5	10	9	0	4	0	0	4	11	3	0	0	0	1	9	0	0	1	4	0	3

Table F-4-2. Number of units by harvest type by year.

Sales Type	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09
Regular	5	6	1	7	17	19	6	15	13	9	20	7	4	7	47	10	11	19	25	20	13	53
Pest Control	5	5	1	2	9	5	0	0	15	14	14	25	2	2	2	2	0	0	0	2	0	0
Fire Salvage	0	9	19	16	0	10	1	1	11	21	4	0	0	0	1	18	0	0	1	8	0	12

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. However, due to past harvest 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) were beyond the Forest Plan variability limits. The 66 units contained a total of 2,022 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 1993-1997 were detrimentally impacted.

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.

2003-2006 Results: One hundred eleven units within 58 sales were monitored during this five year period. Of the 81 line-transected units (1,931 acres) two were determined to be beyond the 15 percent detrimental disturbance level. The two units that exceeded the 15 percent criteria were measured in 2005 and 2006. The total affected area was 9 acres out of 52 total acres for the two units. As noted in the year 2002 there continued to be an increase in the "6-10" and "11-15" categories which is attributable to units that contained past activities (**Tables F-4-3a and F-4-3b**).

2007-2009 Results: This data was collected using a different methodology than the previous 19 years and although similar, is not comparable. For 2007, 30 units from 16 sales were monitored for soil disturbance. Two of the 30 units exceeded the 15 percent detrimental disturbance criteria. The total area for the units was 21 acres, of which roughly seven acres had detrimental disturbance. Both units were required winter logging. The impacts were caused by logging activities that occurred when the ground was not frozen. Between 2008 and 2009 an additional 78 units from 26 sales were randomly selected and monitored for soil disturbance using the new Region 1 Soil Monitoring protocol which the KNF had adopted. None of the units reviewed exceeded an overall 15 percent detrimental soil disturbance value. The total area reviewed between 2007 and 2009 was 4,081 acres (**Table F-4-4b**). As noted in the field the general trend where sampled points within units fall into a detrimental category are where past temporary roads, skid trails, and landings were constructed.

Table F-4-3a. Units by soil disturbance category (line transect).

Disturbance category (%)	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09
<6	0	0	0	0	5	3	8	12	17	17	10	0	1	6	8	4	12	11	17	8	40
6-10	0	0	0	6	4	0	1	6	5	9	4	0	2	14	7	5	4	9	6	5	20
11-15	0	0	0	6	5	0.5	0	0	0	0	3	0	0	8	0	2	2	5	5	0	5
15+	0	0	0	8	1	0.5	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0
Totals	0	0	0	20	15	4	9	18	22	26	17	0	3	28	15	11	19	26	30	13	65

Table F-4-3b. Acres by detrimental soil disturbance category (line transect)

Disturbance category (%)	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09
<6	0	0	0	0	170	32	160	377	637	558	170	0	38	80	362	40	297	315	1108	156	1195
6-10	0	0	0	134	68	0	29	230	129	259	147	0	246	688	285	65	43	312	145	301	549
11-15	0	0	0	122	131	14	0	0	0	0	58	0	0	173	23	9	21	102	33	0	149
15+	0	0	0	245	8	13	0	0	0	0	0	0	0	0	0	0	24	28	88	0	0
Totals	0	0	0	501	377	59	189	607	766	817	375	0	284	941	670	114	385	757	1374	751	1893

Recommendations

Performance for this monitoring is consistent with Forest Plan direction. Of the 159 units sampled in the five year period only four were determined to exceed 15 percent detrimental disturbance. The reason for this exceedance, in all cases, was associated with required winter logging occurring when conditions were not as prescribed. This level of impact can be avoided through diligent sale administration and increased operator awareness. This monitoring item is determined to be within the recommended range stated in the Forest Plan with four exceptions.

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. The Northern Region Soil Monitoring (2009) requirements include sampling of temporary road segments and landings constructed for harvest activity to be monitored. Pre-existing temporary roads and landings fall outside of the category needing to be monitored. Most burn piles still fall outside of the detrimental category. Finally, a large number of additional units were reviewed for soil disturbance as well during this time frame but fall outside of the "random selection" category and can therefore not be included in the tables presented in this section.

Table F4-4a Kootenai NF Soil Monitoring Summary

Year	Total No. of Sales	Total No. of Units	Total Acres	No. of Transected Sales	No. of Transected Units	No. of Transects	No. of Monitoring 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
2003	15	30	675	6	15	42	22183	9	15
2004	5	6	114	5	11	11	362	0	0
2005	11	19	385	11	19	19	372	0	0
2006	11	26	757	11	26	26	608	0	0
Total	237	457	14377	116	231	494	126721	121	231

Table F4-4b Kootenai NF Soil Monitoring Summary using R1 Monitoring Protocol*

Year	Total No. of Sales	Total No. of Units	Total Acres	No. of Transected Sales	No. of Transected Units		No. of Monitoring Points	No. of Walk-through Sales	No. of Walk-through Units
2007	16	30	1374	16	30		1306	0	0
2008	5	13	751	5	13		669	0	0
2009	21	65	1893	21	65		18286	0	0

Total	42	108	4018	42	108		20261	0	0

*Region 1 adopted the new soil monitoring protocol

ROAD ACCESS MANAGEMENT: Monitoring Item L-1

ACTION OR EFFECT TO BE MEASURED:	The miles of road closed surface displacement and soil compaction.
VARIABILTY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 20 percent of the proportion of open to closed roads, as described in the Forest Plan by the end of the first decade.

Purpose: To see if the road closure objectives of the Forest Plan are being achieved. 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 National Forest System roads had either yearlong or seasonal prohibitions in effect (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 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 prohibitions 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 or seasonal prohibitions reached 63 percent. In 2004, the percentage stabilized at 63 percent and continued to be stable through 2007. It has increased to 65 percent in 2009. Table L-1-1 shows the progression. The roads with prohibitions are both yearlong and seasonal prohibitions. The percentage of roads with prohibitions is 8 percent greater than estimated, and the total amount roads without prohibitions are 1,699 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. Prohibitions 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.

The trend over the last five years is that the number of roads where motor vehicle use is prohibited, either yearlong or seasonally, has risen slightly (approx. 86 mi.). This shows that the Forest has exceeded the necessary level of access management (as determined in 1987) 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. 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 since FY87
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	7,908	4,968	63%	2,940	(1,590)
07	7,888	4,983	63%	2,905	(1,645)
08	7,886	5,030	64%	2,856	(1,674)
09	7,888	5,057	65	2,831	(1,699)

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

PROJECT-SPECIFIC AMENDMENTS: 1992 TO 2010

The following table displays a list of approved project-specific Forest Plan amendments on the Kootenai National Forest.

FY	District	Decision Date	Project Name	Standard Amended	Description	Years in Effect
1992	Rexford	7-May-92	Flat Creek	MA 15, TS #5	Placement of units adjacent to existing uncertified units	10 yrs
1992	Three Rivers	9-Jun-92	Arbo Creek	MA 12 ORD. Exceed water yield. MA 12 cover/forage rations, allow timber salvage in MA 2	Water yield created by existing situation	ORD increase-life of sale; MA2 salvage -life of sale; cover/forage rations 10-15 years
1992	Three Rivers	9-Jun-92	4th of July	MA12 ORD, MA12 cover/forage ratios, MA2 timber salvage	Water yield created by existing situation	ORD increase-life of sale; MA2 salvage -life of sale; cover/forage rations 10-15 years
1993	Fortine	12-Jul-93	Meadow View	MA 12, FS #3	ORD of 1.0 during sale; 0.75 after	2 yrs
1993	Libby	2-Jul-93	Weigel Creek	MA 12, FS #3	ORD of 1.9; 0.6 after	2 yrs
1993	Libby	14-Dec-93	Purcell	MA 12 FS #3; MA 14 FS #4 in comp 504; MA 15/16/17/18 WS #2 in comp 503	ORD increase during project activities	2 yrs
1993	Libby	14-Jun-93	Thomas/Gulch Rainy Blue	MA 12, FS #3	ORD of 3.3 (max) during Dec-Aug; 0.6 after	2 yrs
1993	Rexford	23-Jul-93	Compartment 10	MA 12, FS #3	Exceed ORD until 1994	2 yrs
1993	Rexford	25-Apr-93	Dodge Creek Heli	MA 12, FS #3	Exceed ORD until 1994	2 yrs
1993	Rexford	20-Oct-93	Compartment 26	MA 12 WS #7, TS #2	Not meeting hiding cover requirements due to harvest of dead LPP	10-15 yrs
1994	Cabinet	19-Oct-93	Gray Woodchuck	MA 12, FS #3	ORD 1.85 during sale; .75 after	3 yrs
1994	Libby	29-Apr-94	Tepee Salvage	MA 12, FS #3	ORD max 2.3 in Comp 33; 1.5 in Comp 43; ORD after sale 0.7 in Comp 33, 0 in Comp 43	2 yrs
1995	Libby	26-Apr-95	Dry Fork Salvage	MA 12, FS #3	ORD 2.1 during sale; 0.75 after	1 yr
1995	Libby	11-May-95	Road 4904K; Mushroom harvest	MA 12, FS #3	ORD 1.5 during picking	1 yr
1995	Libby	1-Jun-95	Canyon Salvage	MA 15, WS #2	ORD 3.8 during sale; 3.0 after	1 yr
1995	Libby	27-Jun-95	Cripple Horse Salvage	MA 12, FS #3	ORD 2.1 during sale; 0.7 after	1 yr
1995	Libby	27-Jun-95	Brush Creek	MA 12, FS #3	ORD 1.4 during sale; 0.75 after	1 yr

FY	District	Decision Date	Project Name	Standard Amended	Description	Years in Effect
			Salvage			
1995	Libby	18-Aug-95	Peace Alexander Salvage	MA 12, FS #3	ORD up to 2.5 during sale; 0.75 after	1 yr
1995	Rexford	27-Jul-95	Webb	MA 12, FS #3	ORD 1.12 during sale; 0,44 after	2 yrs
1995	Rexford	5-Jan-95	Compartment 4	MA 12 TS #2 and WS #7	Harvest w/in movement corridors	10-15 yrs
1995	Rexford	5-Jan-95	Compartment 26	MA 12, FS #3	ORD 1.3 during sale; 0.75 after	2 yrs
1996	Fortine	6-Feb-96	South End Allotments	MA 24, Range #1	Allow grazing in MA 24	10 yrs
1996	Libby	10-Jan-96	Little Wolf	MA 12, FS #3	ORD max 2.3 in Comp 33; 1.5 in Comp 43; ORD after sale 0.7 in Comp 33, 0 in Comp 43	2 yrs
1996	Rexford	1-Oct-95	North Fork Salvage	MA 12, TS #7; MA 14 TS #5b	Harvest w/in movement corridors	10-15 yrs
1996	Rexford	26-Apr-96	Pinkham Allotments	MA 24, Range #1	Allow grazing in MA 24	10 yrs
1996	Rexford	24-Sep-96	Huckleberry Salvage	MA 12, TS #2, WS #7; MA 12 FS #3	Harvest w/in movement corridors. Existing ORD 0.65; during sale = 1.03, after sale = 0.65	10-15 yrs (movement corridors); 2 yrs (ORD)
1996	Three Rivers	6-Oct-95	South Fork Salvage	MA14, RS #1	Not meet partial retention	15 yrs
1996	Three Rivers/Libby	23-Apr-96	Skyline Ridge/China Basin	ORD in BMU 10	ORD of 1.2 in BMU 10; ORD of 1.71 in BAA 4-10-1	3-4 yrs
1997	Libby	21-Oct-96	Warland Salvage	MA 12 TS #2 & WS #7, MA 12 FS #3	Harvest w/in movement corridors. Existing ORD 2.6; during sale = 2.05, after sale = 0.66	10-15 years; 2 years
1997	Libby	23-Oct-96	Bristow Salvage	MA 12 TS #2 & WS #7, MA 12 FS #3	Harvest w/in movement corridors. Existing ORD 1.27; during sale = 1.27, after sale = 0.74	10-15 years; 2 years
1997	Libby	26-Nov-96	Weigel Salvage	MA 12 TS #2 & WS #7	Harvest w/in movement corridors	10-15 years
1997	Libby	19-Jun-97	Cripple Horse Timber Sale	MA 12 TS #2 & WS #7	Harvest w/in movement corridor	10-15 years
1997	Libby	19-Jun-97	Cripple Horse Timber Sale	MA 12, FS #3	Comp 609 Existing ORD 1.4, during sale 2.2, after sale 1.4 (this is allowed for under amendment #8). Comp 610 existing ORD 0.9, during sale 2.2, after sale 0.0	2 yrs
1997	Rexford	18-Nov-96	Burro Face Salvage	MA 12 TS #2 & WS #7; MA 12, FS #3	Harvest w/in movement corridors. Existing ORD 1.01, during sale 1.49, after sale 0.75	10-15 years; 3 years
1997	Rexford	6-Jun-97	McSutton Salvage	MA 12 TS #2 & WS #7, MA 15 TS #5,	Harvest w/in movement corridors. Harvest adjacent to units not	10-15 years; 2-4 years; 3 years

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				MA12 FS #3	recovered. Existing ORD 0.81, during sale 1.53, after sale 0.75	
1998	Cabinet	26-Jun-98	Beaver Creek Ecosystem Mgmt Project	MA 13, TS #3	Allow harvest in old growth	3-5 years
1998	Cabinet	26-Jun-98	Beaver Creek Ecosystem Mgmt Project	MA 10, WS #3	Suspend snag requirements	3-5 years
1998	Libby	23-Jan-98	Alexander Salvage Timber Sale	MA 12, FS #3	Comp 601, overlaps with amendments for Peace Alexander. Will allow ORD to go to 2.0, after sale 0.63	2 yrs
1998	Libby	9-Mar-98	Sheep Range Timber Sale	MA 10, WS #3	Suspend snag requirements	2-3 yrs
1998	Libby	9-Jun-98	Grubb Salvage Timber Sale	MA 12, FS #3	Comp 643, existing ORD 0.0, during project 1.53, after 0.0	1-2 yrs
1998	Libby	9-Jun-98	Grubb Salvage Timber Sale	MA 12, TS #2	Removal of hiding cover	10-15 years
1998	Libby	17-Jun-98	North Fork Jackson Salvage Timber Sale	MA 12, TS #2, WS #7;	Harvest w/in movement corridors	10-15 years
1998	Libby	17-Jun-98	North Fork Jackson Salvage Timber Sale	MA 12 FS #3	Comp 602. Existing ORD 0.75, during sale 1.5, after sale 0.75	1 years
1998	Three Rivers	16-Jun-98	Wood Rat Timber Sale	MA 10, WS #3	Suspend snag requirements	2-3 yrs
1999	Libby	11-Mar-99	Deer Marl Salvage Timber Sale	MA 12, TS #2	Removal of hiding cover	10-15 years
1999	Libby	23-Jun-99	Dry Pocks Timber Sale	MA 12, FS #3	Comp 579, existing ORD 0.0, during project 1.0, after 0.0	3 years
1999	Rexford	23-Jan-98	Parsnip Lodgepole Pine Salvage Timber Sale	MA 16, TS #4	suspend requirement that existing cutting units will not be enlarged until they are certified as regenerated and recovered	10-15 years
1999	Rexford	16-Jun-99	Pinkham timber sale	MA 12, TS #2 & WS #7	harvest within movement corridors adjacent to un-recovered openings	10-15 years
1999	Rexford	16-Jun-99	Pinkham timber sale	MA 12, FS #3	Comp. 18 and 21. Existing ORD is 1.51 and will increase to 1.81 during activity	3-5 years

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1999	Three Rivers	18-Jun-99	Clay Beaver Timber Sale	MA 12, TS #2 & WS #7	harvest within movement corridors adjacent to un-recovered openings	10-15 years
1999	Three Rivers	15-Mar-99	Pine Timber Sale	MA 10, WS #3	Suspend snag requirements	2-3 years
2000	Libby	8-Jun-00	Syrup Salvage	MA 12. FS #2	Removal of hiding cover	10 yrs
2000	Libby	16-Jun-00	Syrup Salvage	MA 12, FS #3	Comp 578, existing ORD 0.34, during 2.1, after 0.34	3 years
2000	Libby	22-Jun-00	McSwede Timber Sale	MA 16, MA 11	Short term reduction in VQO for both MAs	20-25 years for each
2001	Libby	1-Oct-00	Alexander Timber Sale	MA 12, FS #3	Comp 551, existing ORD 0.33, During 2.0, after 0.33	3 years
2001	Libby	1-Oct-00	Alexander Timber Sale	MA 10, WS #3	Suspend snag requirements	3-5 years
2001	Three Rivers	10-Apr-01	Spar and Lake Forest Health Project	MA 10, WS #3	Suspend snag requirements	3-5 years
2001	Three Rivers	1-May-01	Troy Beetle	MA 10, WS #3	Suspend snag requirements	2-3 years
2002	Cabinet	17-Jun-02	White Pine	MA 13, TS #3	Timber salvage in MA 13	2-3 years
2002	Cabinet	17-Jun-02	White Pine	MA 12, FS #3	Temporary increase in ORD from 0.71 to 2.23	5 years
2002	Cabinet	14-Jun-02	White Pine	MA 10, WS #3	Suspend snag requirements	2-3 years
2002	Rexford	5-Oct-01	Pink Stone fire recovery	MA 12, FS #3	ORD to increase to 2.70 during activities	2-5 years
2002	Rexford	5-Oct-01	Pink Stone fire recovery	MA 12, TS #2, WS #7	harvest within movement corridors adjacent to un-recovered openings	10-15 years
2002	Rexford	14-Dec-01	Gold/Boulder/Sullivan	MA 13, TS #2 and #3	Timber salvage in MA 13	2 years
2002	Rexford	14-Dec-01	Gold/Boulder/Sullivan	MA 12, TS #2, WS #7	harvest within movement corridors adjacent to un-recovered openings	10-15 years
2002	Rexford	14-Dec-01	Gold/Boulder/Sullivan	MA 12, FS #3	ORD increase to 1.52 during project activities	5-7 years
2003	Rexford	11-Oct-02	Young J	MA 12, FS #3	ORD increase to 1.19 during activities	2 years
2004	Cabinet	1-Sep-04	Dead Beaver	MA 10, WS #3	Suspend snag requirements	1 year
2004	Libby	2-Jun-04	Pipestone	MA 12, FS #3	ORD increase in 3 compartments during activities. Post project ORD at or below existing levels for 5 compartments	3-5 years
2004	Libby	2-Jun-04	Pipestone	MA 17, RS #4	Harvest will not meet partial retention VQO	20 years

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2004	Libby	16-Jun-04	South McSwede	MA 12, FS #3	Comp 539 existing and during project ORD of 3.88, post-project ORD of 2.44. Comp 540 existing and during project ORD of 1.20, post project ORD of 1.20	3-5 years
2004	Libby	16-Jun-04	Bristow	MA 12, FS #3	For sub-planning unit, ORD increase from existing 1.0 to 1.5 during. Post-project ORD will be 0.78	3.5 years
2004	Rexford	28-Jul-04	Lower Big Creek	MA 12, TS #2; WS #7	harvest within movement corridors adjacent to un-recovered openings	15 years
2005	Libby	15-Jun-05	Riverview (Alder, Cow)	MA 12, FS #3	ORD of 1.30 during activities, post project ORD of 0.96. Existing ORD = 2.0	5 years
2005	Libby	15-Jun-05	Cow Creek	MA 10, WS #3	Suspend snag requirements	5 years
2005	Rexford	14-May-05	McSutten	MA 12, FS #3	ORD increase to 1.0 during activity	10 years
2005	Rexford	14-May-05	McSutten	MA 12, TS #2; WS #7	harvest within movement corridors adjacent to un-recovered openings	10-15 years
2005	Three Rivers	14-Jun-05	Northeast Yaak	MA 13, TS #3	Timber salvage in MA 13	3-5 years
2006	Libby	18-Apr-06	Smoked Fish	MA 10, WS #3	Suspend snag requirements	5 years
2007	Cabinet	8-Jun-07	West Elk Interface Protection	MA 10, WS #3, TS #3	Suspend snag requirements. Harvest for fuel reduction objectives	3-4 years
2007	Libby	26-Jul-07	Kootenai River North	MA 10, FS #3	Suspend snag requirements	5 years
2008	Cabinet	2-May-08	Marten Creek Project	MA 10, WS #3	Suspend snag requirements	3-4 years
2008	Libby	28-Apr-08	Brush Creek Fire Salvage	MA 12, FS #3	Existing ORD of 0.84 to increase during project activities to 1.28. Post-project ORD reduced to 0.69	3 years
2008	Libby	30-Jul-08	BPA Libby-Troy Transmission Line	MA 10, WS #3	suspend snag requirements	50 years
2008	Libby	30-Jul-08	BPA Libby-Troy Transmission Line	MA 17, RS #4	Harvest will not meet partial retention VQO	50 years
2008	Rexford	25-Apr-08	Young Dodge	MA 12, FS #3	Management at the existing ORD of 0.81 during, and following of project activities	3-6 years
2008	Rexford	25-Apr-08	Young Dodge	MA 12, TS #2; WS #7	harvest within movement corridors adjacent to un-recovered openings	10-15 years
2009	Libby	8-Jun-09	Miller West Fisher	MA 12, FS #3	Existing ORD of 1.30 to increase during project activities to 2.13. Post-	1-2 years

FY	District	Decision Date	Project Name	Standard Amended	Description	Years in Effect
					project ORD returns to 1.30	