

**FOREST PLAN MONITORING
And EVALUATION REPORT
Fiscal Year 1999
Kootenai National Forest**

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SUMMARY

INTRODUCTION

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

We have completed the monitoring of Forest Plan implementation for FY99. This report evaluates the field data collected by the end of September 30, 1999 that pertain to the 17 monitoring items reported annually and 3 items that are reported every two years. Our monitoring and evaluation process is shown in Chapter IV of the 1987 Kootenai National Forest Land and Resource Management Plan (Forest Plan).

We have completed twelve years of implementing the Forest Plan. Information from our monitoring will help identify what we need to change during Forest Plan revision. We have found some methods work well, and some do not. We found that some of our projections were accomplished and some have not been. The summary explains the Forest Plan itself, describes the monitoring methods, and summarizes the results of the annual monitoring items.

FOREST PLAN DECISIONS

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

- **Goals, Objectives, and Desired Conditions** (pages II-1 through II-17 of the Forest Plan) provide general direction regarding where we should be headed as we put the Plan into practice.
- **Standards** (pages II-20 through II-33, Chapter III of the Forest Plan, and Forest Plan amendments) tell us how to put the Plan into practice, or give us conditions we must meet while we implement the Plan.
- **Land Allocation – Management Areas (MAs)**, as described in the Forest Plan Chapter III and displayed on the Forest Plan Map, are those areas of the Forest that are allocated for different types of land management and resource production.

MONITORING

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

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

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

Monitoring and evaluation information will be used as we begin Forest Plan revision. Part of the reason we decided to issue a "Notice of Intent" to revise the Forest Plan, which was issued in November of 1996, was because of our findings in the monitoring program.

SUMMARY OF MONITORING RESULTS

Elk Habitat (C-1b): Monitoring item C-1 has been a five-year monitoring item. However, the Forestwide Blowdown Salvage decision modified C-1 to add a component (C1-b) for monitoring the effects of the Blowdown Salvage on elk habitat. This monitoring item (C-1b) was established to help ensure that elk summer range habitat capability is maintained during projects implemented under the Forestwide Blowdown Salvage decision.

Across the Forest there was only one project occurring in MA 12 that was implemented under the Forestwide Blowdown Salvage Decision during FY99. Two closed roads were opened for this project, one of these was opened for 14 days and the other was opened for 27 days. The longer open time did not meet the required mitigation of the Forestwide Blowdown decision. The monitoring plan required that after two years, a determination whether to continue monitoring this item would be made. No need for continued monitoring has been determined, however, the entire monitoring item (C-1 and C-1b) will be reported in the 2002 monitoring report.

Old Growth Habitat (C-5): Approximately 1,291,900 acres below 5,500 feet have been evaluated for old growth on the Forest since 1988 (there are about 1,865,000 acres below 5,500 feet Forestwide). A total of 145,194 acres (11.2 percent of the acres evaluated) has been designated as old growth. Of the designated acres, 8.9 percent are effective old growth and 2.3 percent are replacement old growth. The level of old growth designated for the compartments validated to date is above the 10 percent level required in the Plan.

After twelve years of old growth validation work, 154 of the 255 compartments (60 percent) have been completely reviewed and an additional 44 compartments (17 percent) are partially done. Much of the unsurveyed areas are in wilderness, proposed wilderness, or areas with very little National Forest System lands. Accordingly, we are meeting Forest Plan direction for old growth, and validation will continue on the unsurveyed areas.

T & E Species Habitat (C-7):

- **Peregrine Falcon:** In FY99 there were no peregrine falcons observed on the Kootenai National Forest, but one was observed on nearby private land near Eureka. Suitable nesting habitat on the Kootenai is localized and not abundant. Due to the steep, cliffy nature of peregrine nesting habitat, activities that could lead to adverse impacts are rare. The peregrine falcon population met national recovery goals in 1999 and was subsequently removed for the endangered species list. Monitoring of the falcon under item C-7, T & E Species, will therefore be discontinued in the future. The peregrine will continue to be treated as a Management Indicator Species on the Kootenai, as well as a Region 1 sensitive species.
- **Gray Wolf:** The Kootenai National Forest makes up a small portion of the Northwest Montana Wolf Recovery Area. The recovery goal for this recovery area is 10 wolf packs.

In FY99, reports of wolf sightings continued at about the same level as recent years. Sightings were noted on the Rexford, Fortine, Libby and Cabinet Ranger Districts. The following wolf packs exist on the Kootenai: Murphy Lake, Graves Creek, Little Wolf, and Wigwam. The Pleasant Valley pack, which spent most of its time on private land but occasionally visited the Forest, was removed during 1999 by US Fish and Wildlife Service (USFWS) personnel due to depredations on livestock. The components of wolf habitat on the Kootenai did not change significantly in FY99 compared to previous years. Big game populations are beginning to rebound after the severe winter of 1996-97, and this should provide adequate prey resources for continued growth in the wolf population.

- **Bald Eagle:** The Montana Bald Eagle Management Plan (MBEWG, 1994) and the Pacific States Bald Eagle Recovery Plan (USFWS, 1986) provide guidance for bald eagle recovery. Bald eagle habitat is generally within one mile of major lakes and rivers. Habitat quality and quantity on the Kootenai is stable, and may be increasing in the long term, as potential nest trees mature. The survey results for FY99 are slightly higher than the long-term (15 year) average since records have been kept. Nesting surveys show the FY99 nesting eagle population continuing at about the same level as the past few years. The USFWS believes the bald eagle has achieved recovery goals and has proposed removing them from the threatened species list.
- **Grizzly Bear:** The Kootenai National Forest contains portions of two grizzly bear recovery zones: the Cabinet-Yaak Ecosystem (CYE) and the Northern Continental Divide Ecosystem (NCDE). About 72 percent of the CYE is located on the western portion of the Forest and about 4 percent of the NCDE is located in the extreme northeast corner. Each of these ecosystems is further subdivided into smaller areas for analysis and monitoring, known as bear management units (BMUs). Grizzly bear habitat effectiveness went down in 7 BMUs and up in 8 BMUs in FY99 compared to FY98. Some changes were due to more accurate reporting rather than actual changes. Most changes were due to timber harvest and other management activities starting or ending in the various BMUs.

Fourteen of the 18 BMUs were at or above the desired 70 percent level (one more than in FY98), and the Forest-wide average for all BMUs was 73 percent, a 2 percent increase from FY98, and slightly above average for the past 10 years.

The Environmental Assessment Decision Notice and FONSI for the Forestwide Blowdown Salvage project was approved on March 24, 1998. This decision established a special monitoring item to assure that the cumulative effects of projects implemented under this decision would meet management direction for grizzly bears. The focus of monitoring is on opening of closed roads and the number of projects active at any one time in each BMU. The decision requires that this item be reported for two year after the decision (starting in 1998 report). There were no projects implemented within the recovery areas under the decision in FY99. This is the final year for monitoring under that decision.

- **White Sturgeon** The USFWS Recovery Plan for the Kootenai River white sturgeon was signed 30 September, 1999. The short-term goals of the Plan are to reestablish natural reproduction and prevent extinction of the species. Long term goals include providing suitable habitat conditions and restoring a natural age-class structure and an effective population size. This stock of fish will be considered for downlisting to threatened status after 10 years only if natural reproduction occurs in three different years; the estimated population is stable or increasing; enough captive-reared juveniles are added to the population for 10 consecutive years that 24 to 120 juveniles survive to maturity; and a long-term Kootenai River Flow strategy is implemented that ensures natural reproduction. Delisting of this population is estimated to take at least 25 years following the approval of the Plan.

The Recovery Plan for the white sturgeon outlines a comprehensive set of actions needed to begin the recovery process. The Plan does not identify actions or objectives that directly affect management of the Kootenai National Forest. However, under the Endangered Species Act (Section 7(a)(1)), the Forest is obligated to use its authorities to aid in the recovery process and to consult with the USFWS on all proposed or authorized activities. The Roderick Ecosystem Burns Project May Affect but is Not Likely to Adversely Affect the white sturgeon. All other projects and activities evaluated by the Forest in FY99 were found to have No Effect on the species.

- **Bull Trout:** The Kootenai National Forest continues to consult with the USFWS on all ongoing activities under Section 7(a)(1) of the Endangered Species Act. During FY99 the Forest consulted on all proposed activities. The Forest has worked closely with the five other western Montana National Forests, Bureau of Land Management and the USFWS to develop Programmatic Biological Assessments for stream surveys, road maintenance, timber stand improvement, trail maintenance, and recreational site maintenance. The Kootenai is also preparing watershed baselines for the four sub-populations supported on national forest lands for submission to the USFWS.

There were four new projects that were evaluated by the Forest that May Affect but are Not Likely to Adversely Affect bull trout. The Sterling Rock Creek Mine Proposal was resubmitted for formal consultation after the Forest changed its effects determination to May Affect, Likely to Adversely Affect bull trout. The remainder of new projects evaluated was determined to have No Effect on the species. As consultation progresses, so will the recovery process.

The Forest continues to work closely with Montana Fish Wildlife and Parks as well as the USFWS to determine distribution and abundance of bull trout within the boundaries of the Kootenai National Forest. From this data the USFWS will determine present status of the four affected subpopulations on the Forest.

Range Use (D-1): Livestock use on the Kootenai was anticipated to be about 12,600 Animal Unit Months (AUMs) per year. The FY99 level of grazing use was 7,796 AUMs or 62 percent of the projected level. Monitoring indicates that riparian protection measures identified in the new grazing permits are being implemented. During the last twelve years, grazing use has averaged 86 percent of projected use, which is within the range anticipated in the Plan. Permittee requests for non-use and Forest requests to defer grazing to prevent stream bank deterioration and over grazing account for use levels being lower than the Plan projected. In review of this monitoring item, no changes are needed to the Forest Plan at this time. During Forest Plan revision, the status of allotments will be reviewed.

Noxious Weed Infestations (D-2): The Forest Plan states that noxious weed infestations will be monitored for increases in total acreage, increases in weed density and the introduction of new weed species on the Forest. Monitoring indicates that several noxious weeds have increased more than 10 percent in the number of acres affected and some have had a 10 percent or more increase in density of existing infestations since the Forest Plan was signed in 1987. There continues to be an expansion of new species, specifically tansy ragwort, in spite of concerted efforts to keep populations in check. There are a number of new species just becoming established on the Forest, and these will continue to spread. Based on these observations, this monitoring item is outside the range prescribed in the Forest Plan. There are several “control” measures being implemented, which should help improve the noxious weed situation on the Forest. It is recommended that no changes be made in the Forest Plan, but that considerable attention be given to the problem during Forest Plan revision.

Allowable Sale Quantity (ASQ) (E-1 and Appendix B): 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. In addition, 60 MMBF was estimated to be sold from unsuitable management areas, averaging 6 MMBF per year. Sell volumes have declined from 200 MMBF per year to about 80 MMBF per year between FY88 and FY99. The average yearly amount sold has been 111.4 MMBF from suitable lands, and 1.5 MMBF from unsuitable lands. In total, this amounts to 1.4 billion board feet for the past twelve years. This actual sell volume is well below the ASQ limit as set in the Plan. In the past six years, additional factors have influenced the timber sales program. The most significant was additional streamside protection measures as required by the Inland Native Fish (INFS) Decision of July, 1995. Also, the USFWS amended biological opinion for grizzly bear recovery was issued July, 1995 and changed how recovery processes would take place on the Forest. In general, it has become more difficult to plan and execute sales due to public controversy, scheduling requirements necessary to meet resource needs, and a shift to a higher level of ecosystem management and forest health issues.

The Forest has not exceeded the ASQ in 12 years of implementation. Large changes in the actual program levels versus projections of the Forest Plan indicate that revision of the Plan will need to address the sustainability of the timber sale program in addition to the sustainability of ecosystems. This has been identified as a critical issue in scoping for Forest Plan revision.

Acres of Timber Sold for Timber Harvest (E-2): The Forest Plan projected 15,740 acres of annual regeneration harvests to achieve the ASQ. During FY99, the general trend, which had been apparent in most years, remained in place. The acreage sold for regeneration harvest is highest for MA 15, while five other suitable timber MAs (11, 12, 14, 16, and 17) continued to be well below Forest Plan projected amounts. Additional harvest occurred in FY99, but was either salvage or intermediate harvest that did not result in a regenerated stand.

Many of the factors affecting this monitoring item are similar to those affecting item E-1, ASQ. As stated in the evaluation for that item, wildlife habitat management, watershed concerns, litigation, appeals, deferrals, and changes in management area designation based on ground verification have all affected the potential to meet the Plan's projected regeneration harvest.

It is apparent that the acres sold for regeneration harvest will not meet the acreage projected in the Forest Plan. The upcoming revision of the Plan will provide the opportunity to assess appropriate levels of harvest volume and acreage in line with sustainable ecosystem management principles and new planning regulations.

Suitable Timber Management Area (MA) Changes (E-3): Management areas (MAs) are validated during site-specific project analysis. When inaccuracies are found, MA boundaries are corrected to keep the Forest Plan MA map current.

Acreage losses occurred in MA 14, 15 and 16, while MA 11 and 12 gained acreage in FY99. Total net loss in the suitable land in FY99 was 3,148 acres. Most of these MA changes were made in the process of designating MA 13 and other old growth management areas. This monitoring item is outside the prescribed range for MAs 11, 15 and 16 (more than 5,000 acres of change).

The degree to which changes have been made to management area designations indicates continuing validation in Forest Plan MAs. The large change in the suitable management area category of over 60,000 acres amounts to approximately 3 percent of the total suitable base. During revision of the Forest Plan, sustainability and ASQ calculations will be made using the validated management areas. An assessment of the effect of changed management area designations will also be done during the revision process.

Timber Harvest Deferrals (E-7): To determine the effect of harvest deferrals on the timber sale program, monitoring is done in two different categories. Category A deferrals are those that result from our project-specific conclusions. Category B deferrals are those that result from an externally imposed situation.

In FY98, 2,622 acres in Category A were deferred, and 973 acres were deferred in Category B. For FY99, more acres were deferred in Category A in comparison to several preceding years. Deferrals took place due to a variety of reasons, including potential impact to watershed, fisheries, roadless resources, economically unfeasible harvest units, or difficulty in finding an appropriate logging system to fit the situation.

For the entire period from FY88-99, 38,578 acres were deferred for both A and B categories. The largest amount for a single MA is 22,778 acres that were deferred in MA 12. This is the largest amount of all the MAs and is beyond the prescribed evaluation range of 10,000 acres. MA 14 and 15 also had large amounts of harvest deferred, although they did not exceed the 10,000 acre evaluation

range. This item indicates that many more factors affect harvest than was accounted for during the preparation of the Forest Plan. Since the Forest now has detailed records of such factors, it will be more able to assess those effects during Forest Plan revision. These factors will continue to be monitored, and will be brought forward in the revision process.

Harvest Area Size (E-8 and Appendix C): The average size of units harvested between 1988-1999 is well below the objectives of 20 acres for MA 11 and 40 acres for MA 12. Average size for the other suitable MAs is also below 40 acres.

Appendix C lists the harvest areas resulting in larger than 40 acre openings approved during FY99 as well as an estimate of how long it will take for the vegetation to regrow to meet the management area objectives. There were 16 resultant openings greater than 40 acres approved by the Forest Supervisor in FY98 and 29 openings in FY99. All were in response to either root disease, Douglas-fir bark beetle, windstorm, or dead lodgepole pine situations. Based on review of the monitoring information, no changes are needed to the Forest Plan. Projects approved to exceed 40 acres were done with the appropriate documentation and analysis and, therefore, are consistent with the Plan.

Clear Cut Acres Sold (E-9): The acres sold for clearcut harvest declined from FY90 to FY99, with the exception of FY96. In that FY, the amount of clear cutting increased primarily due to emphasis on salvaging fire-killed timber created by the 1994 fires and dead lodgepole pine killed by the mountain pine beetle epidemic. In FY99 the amount of clearcutting declined again resulting in a 95 percent decrease. The Forest will continue to monitor this item, but the Chief's goal for reducing clearcutting has been fully met.

Riparian Areas (C-9): Miles of stream classes and/or stream categories identified and mapped: Almost 5,800 lineal miles of riparian habitat have been categorized and mapped since 1988. Over 3,300 of these miles are perennial streams (Stream Classes 1 and 2, INFS Categories 1 and 2). The rest are intermittent and ephemeral streams (Stream Classes III, INFS Category 4).

Determining whether INFS standards and guidelines were applied during projects: In FY99, default RHCA widths were applied on all but three projects. These three were modified based on sight-specific analyses that determined that the RHCA function could still be met with a slightly narrower RHCA width. Default RHCA width were applied on almost 32 miles of stream, reduced widths on 0.4 miles.

RCHA activity tracking: In 1999, a little over 95 miles of RHCA had some level of activity. Most of the work was for road re-construction, improvement of road crossings, road drainage improvement, trail maintenance and improvements along streams.

Watershed and stream restoration activities: In 1999, riparian-related watershed restoration activities were accomplished on over 70 miles of stream. Over 56 stream crossings were removed or improved, and over 120 sites had improvements such as ditch relief culverts, stream channel veins (near bridges), or large woody debris (LWD) addition to reaches where woody debris was lacking. Since 1990, watershed restoration on the Forest has totaled over 6,700 acres.

Riparian Area BMP results: Implementation and effectiveness of applicable riparian Best Management Practices (BMPs) that were used during management activities in or near the riparian

zone were evaluated in FY99. Seventy-four practices were evaluated and acceptable implementation was accomplished 100 percent of the time. Fifteen effectiveness evaluations were completed for this same period, of which 87 percent of the BMPs were deemed to be effective. For eleven projects, a riparian-area specific BMP evaluation was made. On all these projects, BMP requirements related to riparian area protection were met.

For the 2,410 practices evaluated over the ten-year period (1990-1999), acceptable implementation was accomplished 93 percent of the time. Almost seventeen hundred effectiveness evaluations were completed for this same time period, of which 93 percent were deemed to be effective.

We are effectively applying the Riparian Area Guidelines, INFS direction, and riparian BMPs on projects; therefore, we are on-track with the Forest Plan. Because of the new direction from INFS, no change to Forest Plan direction is needed at this time.

Fisheries Habitat (C-10): The Forest Plan indicated that stream surveys, streambed coring, water temperature, woody debris counts, redd counts, and/or embeddedness sampling could be used as data sources to assess the effects of implementation on fish and habitat. After FY92 we added channel geometry, particle size distribution and riffle stability index (RSI) as data sources. We determined that data would be collected using these methods on a number of watersheds across the Forest including areas that had not been harvested or roaded.

This monitoring item is to be reported every two years, however, it will be reported annually because of the relationship to Monitoring Item F-2, Sedimentation.

At this point in time we cannot determine whether implementation of existing Forest Plan prescribed practices results in stream conditions that are outside the variability limits set in the Plan. It is difficult to distinguish among a variety of possible causes for change in streams. Our ability to detect changes in streams and habitat and identify the cause using the C-10 monitoring data is low, and the risk of a faulty conclusion continues to be high. Also, many of the monitoring variables are much more variable than assumed, and thus the accuracy and reliability of C-10 data may be moderate at best. The 1999 monitoring results reinforce the conclusions that were previously disclosed in the 1996-98 reports, and indicate the need to change the monitoring requirements.

We have established a team to develop a new monitoring program for fish and fish habitat. We are still exploring options to evaluate these elements. We have revised the C-9 monitoring requirement to better track implementation of Best Management Practices and INFS standards and guides as recommended by the C-10 interdisciplinary team. We have also issued a Kootenai National Forest policy statement on how to site-specifically designate INFS riparian buffer strips to ensure Forest-wide consistency in this critical habitat protection strategy and have completed a Best Management Practices training program for all field personnel to improve our performance in watershed and habitat protection.

Habitat restoration efforts continue to focus on mitigation of sediment and woody debris impacts. These efforts are focusing on known sediment sources and areas lacking woody debris. We will continue restoration efforts where project analyses indicate a need.

Soil and Water Conservation Practices (F-1): FY99 BMP monitoring on the Forest involved three different efforts: 1) BMP monitoring done by Kootenai Forest personnel during their normal work activities; 2) BMP Reviews conducted on selected activities by District and Engineering Zones; and 3) Supervisors Office-level BMP Reviews on three Districts. KNF personnel audited about 27 separate projects in FY99. Implementation evaluations were completed for 149 BMPs and implementation evaluations met the requirement of acceptable over 98 percent of the time. Effectiveness evaluations in FY99 met the requirements of acceptable almost 95 percent of the time. As a result of these monitoring efforts, there were key findings identified that will strengthen on-the-ground practices.

No changes to the Forest Plan are needed at this time. The Forest will continue to improve the BMP process and program which emphasizes monitoring, implementation, evaluation, documentation, tracking and completion of the feedback loop to improve resource protection. Another key item is the implementation of the Regional Forester's memo of March 11, 1999 to bring existing roads up to BMP Standards.

Stream Sedimentation (F-2): The Plan identified seven streams that would be monitored for this item. They are: Big, Sunday, Bristow, Red Top, Rock, Granite and Flower Creeks. The data to be collected includes bedload and suspended sediment concentrations and streamflow. Nearly all of the Forest's monitoring effort for this item has been dedicated to suspended sediment monitoring for timber harvest and road construction activities. This data is to be used to look for evidence of a change in streambed and water quality conditions, and thus probable effects on beneficial uses, related to present management direction. In addition, a parallel goal has been to gather enough data so that the Forest's sediment predictive tool (R1-WATSED) can be validated and refined for general use before activities are implemented.

The data from this monitoring requirement must be evaluated in the context of results from Monitoring Items C-9, C-10, F-1 and F-3. As with these other monitoring items, the goal of this item is to confirm whether beneficial uses are being protected and water quality laws are being met.

In 1992 we determined that this monitoring item and monitoring item C-10 as designed would not allow a meaningful evaluation of sedimentation from Forest Plan management such as timber harvest and road construction. Based on this we determined that we would accept the intent of this monitoring item but add some additional data sources to help understand the effects of our management. The FY96 Monitoring Report included a nine-year evaluation of the monitoring results for this element. The 1996 nine-year evaluation concluded that a need for change in C-10/F-2 monitoring was apparent, and that a team should be assembled to identify the best course of action. This report incorporates by reference, the nine-year evaluation of F-2 and updates that evaluation with any new information from 1999.

Information regarding streambeds, suspended solids and streamflow has been collected in several of the seven representative watersheds. This same data has also been collected in many more watersheds not specifically identified in the Plan. The monitoring results suggest the need for change in some areas, but the certainty of these findings is weakened by limitations in the data.

Water Yield Increases (F-3): In FY99, the water yield model was used to estimate the peak flow increase on 172,538 acres of both National Forest and private land. Most of these watersheds have

been analyzed in previous years and include many acres of private land. Of the total area analyzed during the fiscal year, 7 percent of the acres exceed Forest water yield guidelines. Channel damage has not necessarily occurred in watersheds shown to be exceeding water yield guidelines since this monitoring item is based on computer modeling and not field observations and measurements.

Approximately 2,000,000 acres have been analyzed for water yield conditions on the Kootenai since 1988. Of this total, 1,560,420 acres (77 percent) were found to be at or below the guidelines and 477,448 acres (23 percent) were found to be over guidelines according to the most recent analysis in each area, which could be up to ten years old.

This monitoring item continues to be off-track with the Forest Plan. It is important to note, however, that when projects are proposed in watersheds that are over the standard, they are designed to improve the long-term watershed condition, are rescheduled, or are dropped (See Monitoring Items E-1 and E-7). This monitoring item shows that water yield calculations and stream channel analysis are an important part of the analysis needed before projects can be implemented.

Emerging Issues (H-2): This item identifies those issues that appear to be developing since the Forest Plan was initiated, and also monitors the original Forest Plan issues that are still of concern. Emerging issues include: listing of the lynx, road obliteration, road closures, providing access to private land, noxious weeds, the amount and type of timber being offered, opening sizes and disturbance patterns, downsizing of budgets and workforce, firewood availability, prescribed burning (smoke), use of fire and timber harvest in old growth stands, OHV management with special emphasis on snowmobiles. Forest Plan issues that are still current concerns include: grizzly bear management, timber supply (local economic impact), road management and public access, potential mineral development, visual (scenic) quality, and community stability (in the broader sense of using the natural resources of National forest System land to provide jobs related to recreation, tourism, and forest products other than timber). These emerging issues will be reviewed during Forest Plan revision to determine if and how they should be resolved.

Forest Plan Costs (H-3): Timber sales unit costs for FY99 decreased from the average in the preceding six years. However, costs are three times greater than projected, which is well outside the +/- 10 percent range prescribed in the Plan. This increase is due to the increasing complexity in timber sale preparation, along with a concurrent decrease in the amount of timber volume being sold. Timber road unit costs were down from the average of the preceding six years and are actually lower than the cost predicted in the Forest Plan. The reduction in unit costs is reflective of a reduced amount of road construction and reconstruction. Reforestation unit costs were slightly lower than the last six years, but approximately 24 percent higher than the projected Forest Plan amount. Precommercial thinning unit costs continue to stay well below projected costs. Since unit costs have increased significantly in timber sale preparation, timber roads, and reforestation, there will be a need to factor in such changes during Forest Plan revision. The Forest's accounting systems are continuing to effectively track these trends. During the revision process, cost efficiency analysis will include these elements and others as appropriate.

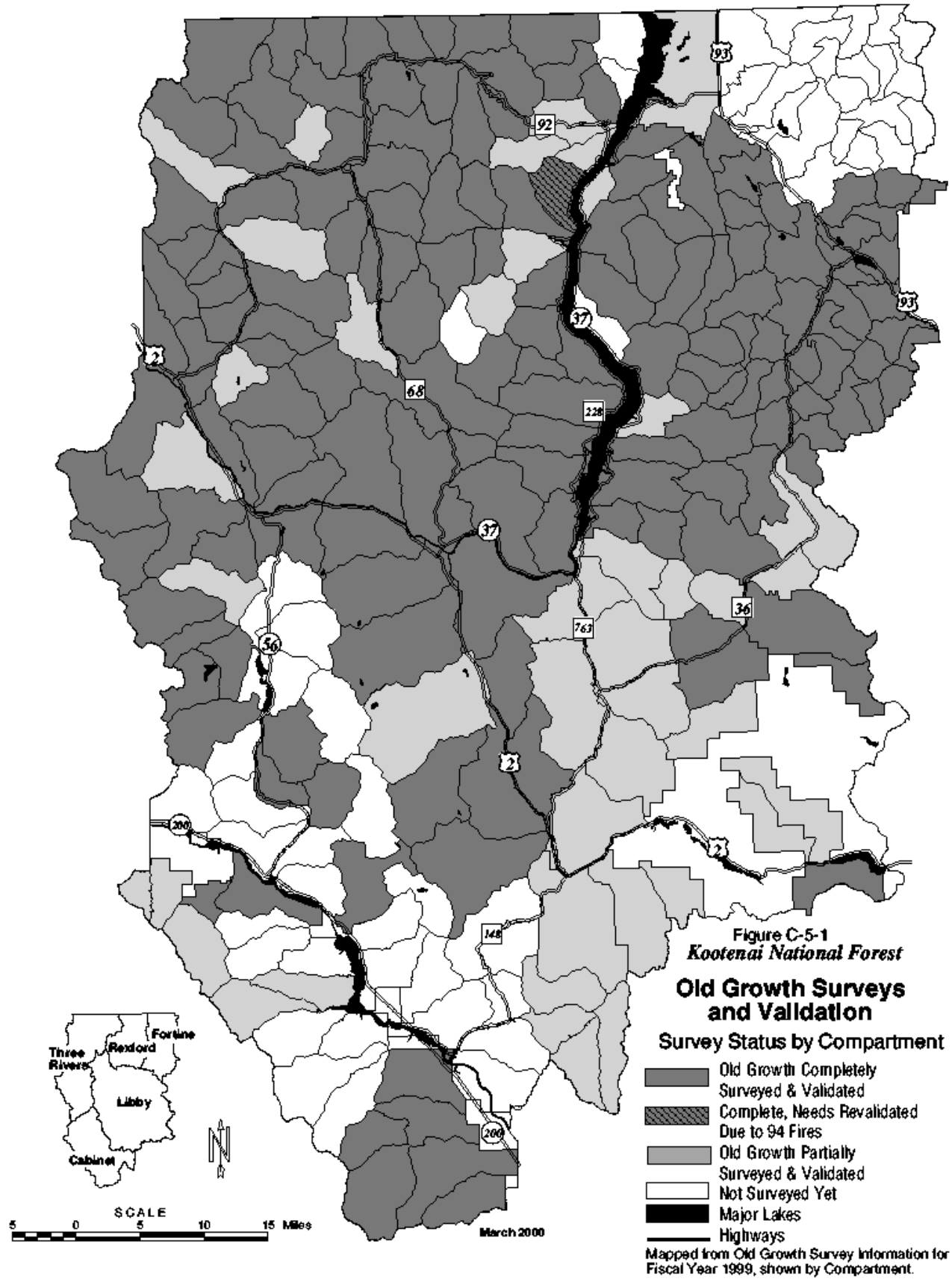
Forest Plan Budget (H-4): As in prior years, there is a great deal of variation in the level of funding for various program areas in comparison to the projected amounts. Notable areas where funding has increased beyond expected are in fire suppression, fuels management, range, co-op law enforcement, tree improvement, salvage sales and trail construction and reconstruction. Most other program areas

are remaining at budget levels below those projected. However, given major trends now seen since 1988, it is apparent that many programs and costs have changed substantially, and the Forest Plan predictions are no longer fully valid. This analysis will be helpful in budget analysis for Forest Plan revision.

Insect and Disease Status (P-1): Commercial thinning (2,978 acres) and precommercial thinning (7,418 acres) treatments have occurred on the Forest over the last two fiscal years. Both treatments include reduction of stocking levels to reduce stress while improving species mixtures that are less susceptible to insect and disease problems. Insect and disease damaged trees are normally reduced during these operations. Mistletoe infected overstory trees on recently regenerated stands have been reduced on over 7,000 acres. Pruning of white pine blister rust infected western white pine occurred on 28 acres. Prescribed burning following harvest and for wildlife habitat improvement sometimes increases insect activity, but at a low level. The Forest surveyed about 16,500 acres for dwarf mistletoe infection in FY98 and FY99. We found few infections in the seedling and sapling size class but did find infection in mature trees of western larch, lodgepole pine, and Douglas fir in or adjacent to many plantations that pose a threat to spreading this disease. Follow-up treatments are proposed in stands that may cause subsequent problems in regenerated stands. 479 acres of mistletoe-infected overstory trees were treated in FY98 and FY99. Western gall rust continues to infect many lodgepole pine stands recently precommercial thinned. Root diseases continue to infect regenerated species with low resistance primarily in the western districts. The vast majority of stocking in these plantations is composed of intolerant species not highly susceptible to root disease.

Project Specific Amendments (Appendix C): Project specific amendments are changes in a standard that only apply to that project. They do not change the standard for the long term. The Forest Plan states, "If it is determined during project design that the best way to meet the goals of the Forest Plan conflicts with a Forest Plan standard the Forest Supervisor may approve an exception to that standard for the project". There were four timber sale projects with 29 openings greater than 40 acres that were approved by the Forest supervisor. The rationale was associated with harvesting dead and dying timber stands to improve long-term forest health.

Programmatic Forest Plan Amendments (Appendix D): Two Programmatic Forest Plan Amendments were approved in FY99. One modified MA 12 open road densities for the duration of Compartment 592 in Chief, Marl, Deer and Tensaw Creeks on Libby District, and the other modified open road densities in Compartment 18 and 21, Pinkham Planning Area on Rexford Ranger District.



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

ACTION OR EFFECT TO BE MEASURED: Changes in elk habitat capability from implementation of Forestwide Blowdown Salvage project.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Any downward trend in elk summer range habitat effectiveness, due to non-compliance with project design criteria.



Purpose: Monitoring Item C-1 has been a five-year monitoring item. However, the Forestwide Blowdown Salvage decision modified C-1 to add an annual component (C-1b) for monitoring the effects of the Blowdown Salvage on elk habitat. The entire monitoring item (C-1 a and b) will be summarized in the 2002 monitoring report.

This monitoring item was established to help ensure that elk summer range habitat capability is maintained during projects implemented under the Forestwide Blowdown Salvage decision. The Decision Notice for the Forestwide Blowdown Salvage project requires that this item be reported annually for two years. This is the second year of reporting. The expected precision and reliability of the information are high.

Background: The Decision Notice for the Forestwide Blowdown Salvage project was approved on March 24, 1998. This decision established a special monitoring item to assure big game (especially elk) summer range habitat effectiveness (based on open road densities) would be maintained. The focus of monitoring is on the opening of closed roads in summer range (MA-12). Mitigation included in the Blowdown decision requires that closed roads not be opened for more than 14 days. The decision requires that this item be reported for two years after the decision.

Evaluation: Across the Forest there was only one project implemented in MA 12 under the Forestwide Blowdown Salvage Decision during FY99. The project was the Tweedledee Blowdown timber sale on Rexford Ranger District. Two closed roads were opened for this project. One of these, the 7998 road, was opened for 14 days. The other road, 7996B, was opened for 27 days. These results are summarized in Table C-1-1.

Table C-1-1 **Elk (MA 12) Blowdown Salvage Monitoring Summary**

Project Name	Road Number	Road Miles Opened	Number of Days Open
Tweedledee Blowdown SSTS	7996B	1.5	14
Tweedledee Blowdown SSTS	7998	4.0	27

Summary: On the one project implemented, one road opening did not meet the required mitigation in the Forestwide Blowdown decision.

Recommended Action: The Forest Supervisor will provide a letter of direction to District Rangers to ensure that any future road openings will be fully in compliance with the Blowdown decision. The monitoring requirements for this item have been completed. The monitoring plan required that after two years, a determination whether to continue monitoring this item would be made. No need for continued monitoring has been determined, however, two-year results will be summarized along with the full C-1 five-year monitoring item in 2002.

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

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



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

Background: Old growth habitat is recognized as an important and necessary element of diversity that supports a myriad of wildlife species. Maintenance of adequate old growth will assist in ensuring viable populations of native species and in maintaining diversity as required by the National Forest Management Act of 1976 (16 U.S.C. 1600) (FP, Appendix A17-14). To provide habitat for viable populations, the Plan specifies that 10 percent of the Forest land below 5,500 feet elevation would be managed as old growth habitat for dependent wildlife species. This amounts to a minimum of 186,500 acres and ideally would be equally distributed in all drainages on the Forest.

Forest Service Manual 2400, Timber Management, Kootenai Forest Supplement number 85 issued in January, 1991 provides the direction for validation of old growth on the Forest. This supplement clarifies standards for old growth habitat validation on the Forest before any timber sales containing mixed conifer can be sold. One of the requirements established is that old growth habitat be validated and protected at the 10 percent level in each third order drainage or compartment. If 10 percent old growth does not exist within a compartment, then old growth from an adjacent compartment can be used to make up the 10 percent, as long as there is 10 percent old growth when both compartments are combined. This is shown as "Effective Old Growth" in Tables C-5-1, C-5-2.

If no other effective old growth is available then the best available soon-to-be old growth is identified to bring the third order drainage or compartment up to 10 percent. These protected, mature stands are known as old growth replacement stands because they are replacing a current deficiency of high-quality old growth habitat and will provide for old growth habitat in the future as they age and gain the desirable attributes. This is shown as "Acres of Replacement Old Growth" in Table C-5-2. Management emphasis is to provide the best possible distribution of old growth habitat wherever possible, and high-quality old growth is to be a priority for protection (see the Forest Plan Glossary and Appendix 17 of the Plan for more detail on the description of old growth attributes, including desired distribution patterns).

Results: Table C-5-1 displays the result of the old growth validation surveys for each fiscal year from FY 88 through FY99. In 1998 372,454 acres were surveyed and old growth was designated for 42,304 acres (11.2 percent) in those areas. In 1999 269,920 acres were surveyed and old growth was designated for 28,587 acres (10.6 percent) in those areas. Some of these areas include reassessments of previously completed compartments because of changed conditions and so the information in Table C-5-1 cannot be totaled as this would result in double-accounting of some acres.

Table C-5-1 **Old-Growth Habitat and Condition Survey Results**

FY	Acres Surveyed	Protected Old Growth Habitat		Portion of Protected Old Growth that is Fully Effective Old Growth Habitat	
		Acres	Percent	Acres	Percent
89	94,210	12,730	13.5%	8,450	66%
90	176,560	18,770	10.6%	17,030	91%
91	334,300	39,410	11.8%	36,520	93%
92	212,380	20,930	9.9%	15,500	74%
93	72,253	10,393	14.4%	8,455	81%
94	49,381	5,474	11.1%	4,312	79%
95	158,736	19,416	12.2%	14,340	74%
96	215,483	24,080	11.2%	17,954	75%
97	158,495	16,948	10.7%	15,650	92%
98	372,454	42,304	11.2%	33,626	79%
99	269,920	28,587	10.6%	19,894	70%

Whenever an area is resurveyed, the information for the new survey is used in place of previous survey information. The table below reflects the current Forest-wide summary of surveyed areas and protected old growth. The accompanying map has been shaded to show where old growth evaluation is completed, partially completed, or is still undone.

Table C-5-2 **Summary of Total Protected Old Growth for Areas Validated**

Fiscal Years	Acres Below 5500 Feet	Effective Old Growth		Replacement Old Growth*		Total Protected Old Growth	
		Acres	Percent	Acres	Percent	Acres	Percent
1988-99	1,291,922	115,670	8.9%	29,524	2.3%	145,194	11.2%

* Soon-to-be old growth that is designated when no other old growth is available to meet the 10% requirement

Evaluation: As noted in table C-5-2, approximately 1,291,900 acres below 5,500 feet have been evaluated for old growth on the Forest since 1988 (there are about 1,865,000 acres below 5,500 feet Forest-wide). A total of 145,194 acres (11.2 percent of the acres evaluated) has been designated as old growth. Of the designated acres, 8.9 percent are effective old growth and 2.3 percent are replacement old growth. The level of old growth designated for the compartments validated to date is above the 10 percent level required in the Plan.

The map shows how many areas across the Forest have been validated for old growth. After twelve years of old growth validation work, 154 of the 255 compartments (60 percent) have been completely reviewed and an additional 44 compartments (17 percent) are partially done. Map C-5-1 indicates those compartments completely and partially reviewed and also shows that much of the unsurveyed areas are in wilderness, proposed wilderness, or areas with very little Forest Service ownership. Accordingly we are confident that the Forest is meeting old growth direction.

Recommended Actions: Based on review of this monitoring item, no changes are needed in the Forest Plan at this time. Good progress is being made in the validation effort and will continue.

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

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

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



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

Evaluation:

Peregrine Falcon: In FY99 there were no peregrine falcons observed on the Kootenai National Forest, but one was observed on nearby private land near Eureka. Sightings are rare on the Forest. Suitable nesting habitat on the Kootenai is localized and not abundant. Due to the steep, cliffy nature of peregrine nesting habitat, activities which could lead to adverse impacts are rare.

The peregrine falcon population met national recovery goals in 1999 and was subsequently removed from the endangered species list. Monitoring of the falcon under Item C7 Threatened and Endangered Species will therefore be discontinued in the future. The peregrine will continue to be treated as a Management Indicator Species on the Kootenai, as well as a Region 1 sensitive species.

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

In 1999, reports of wolf sightings continued at about the same level as recent years. Sightings were noted on the Rexford, Fortine, Libby, and Cabinet Ranger Districts. Many of these were sightings of individuals from established wolf packs, but other sightings may be of transient individuals.

The following wolf packs now exist on the Kootenai: Murphy Lake, Grave Creek, Little Wolf, and Wigwam. Wolves from each of these packs spend a portion of their time on the Forest and the remainder on other National Forests, State, or private lands. The Wigwam pack spends a majority of its time in Canada, and USFWS does not count it towards the 10 pack recovery goal for northwestern Montana. The Pleasant Valley pack, which spent most of its time on private land but occasionally visited the Forest, was removed during 1999 by USFWS and USDA APHIS Wildlife Services personnel due to depredations on livestock.

A minimum estimate of 31 wolves used the Forest during 1999, including 11 adults and 20 pups. Ten wolves were radio-collared by USFWS personnel during the year. One wolf pup from the Murphy Lake pack was killed by a train. Control officers shot six wolves from the Pleasant Valley pack, and 4 others were captured from this pack for relocation. Two of these (pups) died during transport and the remaining two were released at Spotted Bear on the Flathead NF. Another wolf

which disappeared from the Murphy Lake pack in 1998 was captured in Bass Creek during the year and also moved to Spotted Bear.

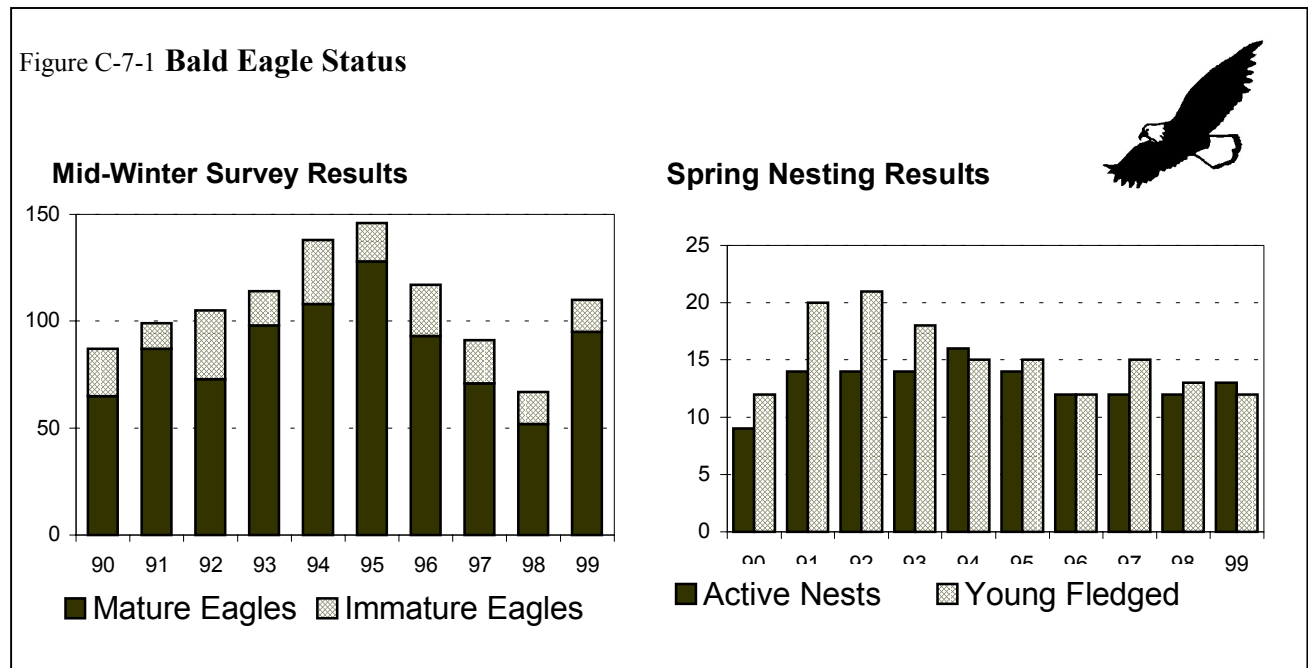
The components of wolf habitat on the Kootenai did not change significantly in 1999 compared to previous years. Big game populations are beginning to rebound after the severe winter of 1996-97, and this should provide adequate prey resources for continued growth in the wolf population.

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

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

Figure C-7-1 shows the results of mid-winter bald eagle population surveys. Sightings occur mostly along major watercourses both on the Forest and on adjacent ownerships. Results are highly variable from year to year due to varying weather conditions. The survey results for 1999 are slightly higher than the long-term (15 year) average since records have been kept.

Numbers of active eagle nests and young eagles fledged are also shown in Figure C-7-1. Nesting surveys show the 1999 nesting eagle population continuing at about the same level as the past few years. USFWS believes the bald eagle has achieved recovery goals and has proposed removing them from the threatened species list.



Beginning in FY96, eagle nest results reflect only nests occurring on National Forest lands. Previous years' data reflect nests on other ownerships as well as National Forest. FY98 nesting data was revised this year to correct an error in last year's report.



Grizzly Bear: The Kootenai National Forest contains portions of two grizzly bear recovery zones: the Cabinet-Yaak Ecosystem (CYE) and the Northern Continental Divide Ecosystem (NCDE). About 72 percent of the CYE is located on the western portion of the Forest and about 4 percent of the NCDE is located in the extreme northeast corner (see Map C-7-1). 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 within the Yaak River area, assisting with bear augmentation tests and monitoring in the Cabinet Mountains, and working with local citizens and interest groups to achieve understanding and consensus on grizzly bear management issues.

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

Habitat Effectiveness: Figure C-7-2, Table C-7-1 and Figure C-7-3 show habitat effectiveness values for each of the BMUs evaluated during fiscal years 1988-99. Effectiveness is based on the percent of habitat available to bears, and the desired level is 70 percent or more. Habitat effectiveness went down in 7 BMUs and up in 8 BMUs in FY99 compared to FY98. Some changes were due to more accurate reporting rather than actual changes. Most changes were due to timber harvest and other management activities starting or ending in the various BMUs. Some of these activities were on private lands, and the Forest Service has no authority over these activities or their effects on grizzly bear habitat effectiveness. Fourteen of the 18 BMUs were at or above the desired 70 percent level (one more than in FY98), and the Forest-wide average for all BMUs was 73 percent, a 2 percent increase from FY98, and slightly above the average for the past 10 years.

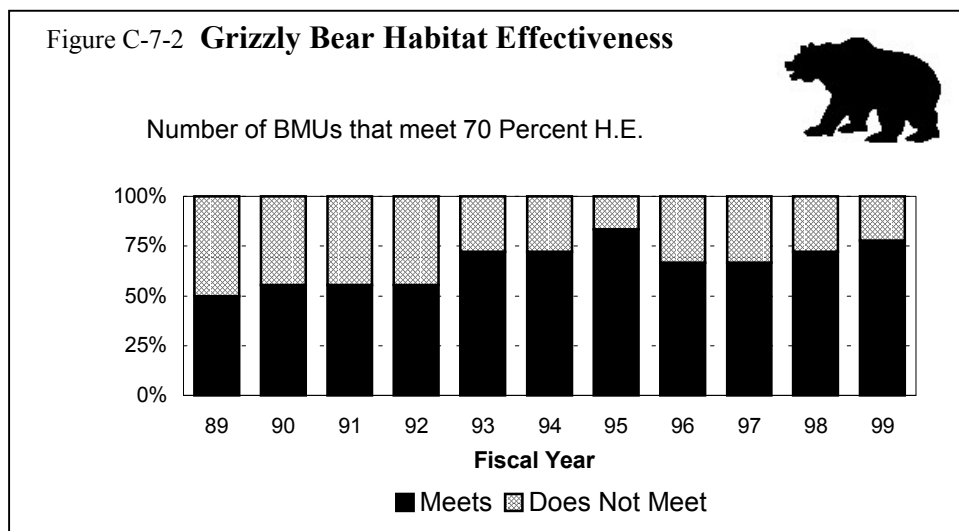
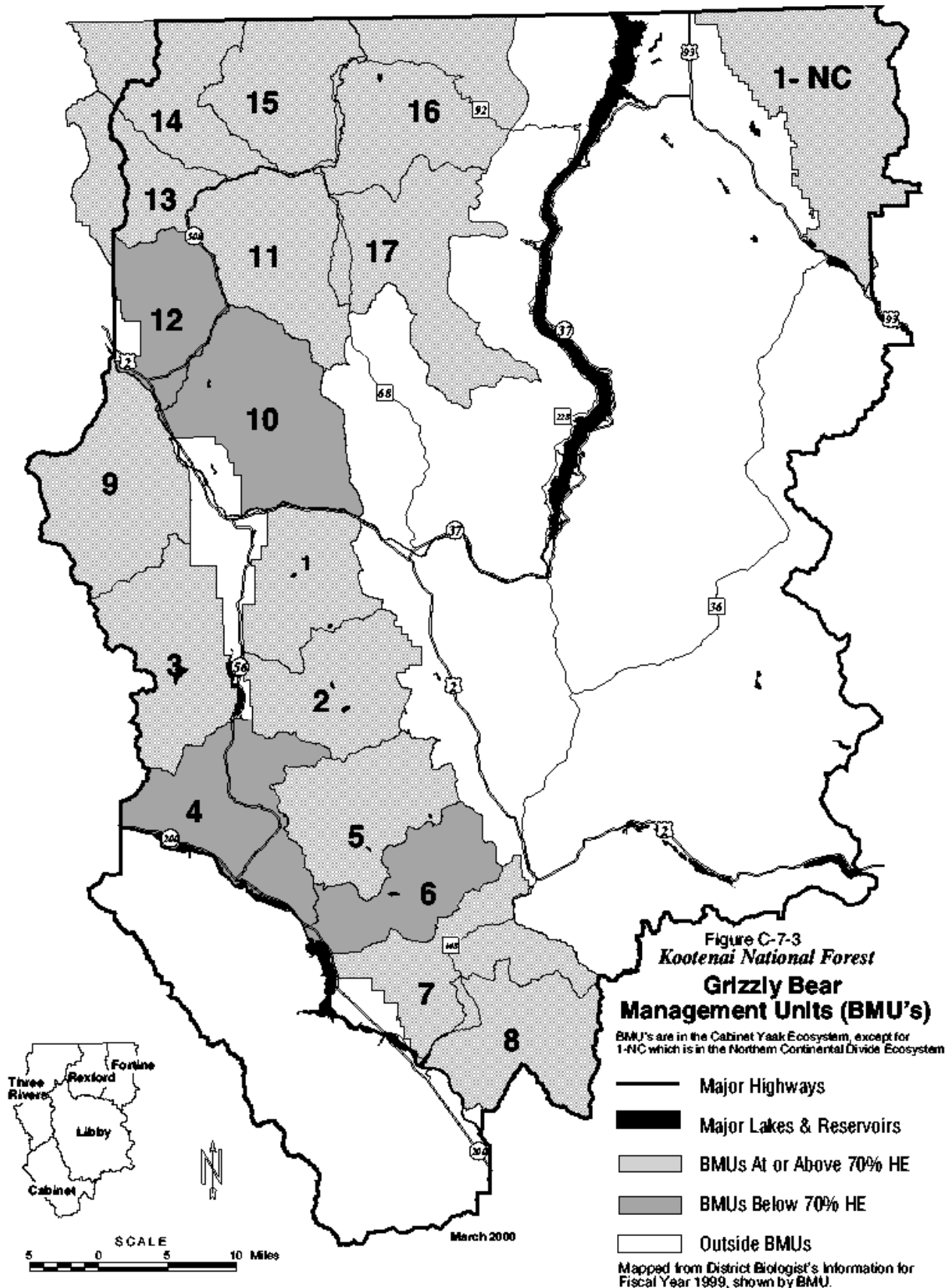


Table C-7-1 **Grizzly Bear Habitat Effectiveness by Fiscal Year**

R.D	BMU: Grizzly Bear Management Unit	FY 90	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99
3	#NC1 Murphy Lake	78%	78%	78%	78%	78%	78%	76%	76%	76%	76%
(4) 5	#1 Cedar	81%	82%	79%	79%	86%	81%	81%	86%	85%	88%
4 (5) 7	#2 Snowshoe	82%	81%	82%	82%	84%	85%	85%	85%	83%	85%
4	#3 Spar	70%	70%	79%	78%	77%	77%	78%	76%	78%	78%
7	#4 Bull	80%	80%	80%	92%	64%	63%	63%	62%	62%	62%
(5) 7	#5 Saint Paul	79%	80%	78%	81%	75%	74%	73%	74%	75%	74%
(5) 7	#6 Wanless	72%	74%	76%	76%	71%	72%	66%	66%	68%	67%
(5) 7	#7 Silver B/Fisher	87%	87%	87%	82%	82%	82%	82%	81%	81%	79%
7	#8 Vermilion	80%	73%	73%	71%	71%	74%	77%	77%	77%	73%
4	#9 Callahan	62%	67%	70%	74%	74%	76%	76%	76%	73%	71%
(4) 5	#10 Pulpit	62%	62%	54%	65%	65%	70%	68%	57%	57%	61%
(4) 5	#11 Roderick	66%	68%	66%	70%	70%	70%	74%	74%	70%	73%
4	#12 Newton	43%	53%	53%	49%	49%	49%	62%	57%	44%	62%
4	#13 Keno	72%	72%	69%	70%	72%	73%	72%	72%	72%	71%
4	#14 Northwest Pk	68%	68%	68%	72%	74%	72%	74%	74%	74%	71%
4	#15 Garver	62%	62%	54%	65%	65%	70%	68%	63%	66%	70%
1 (4)	#16 E Fork Yaak	59%	61%	62%	64%	64%	73%	72%	70%	70%	74%
(1)4 5	#17 Big Creek	58%	63%	64%	68%	70%	68%	68%	68%	71%	71%
	Forestwide Average	69%	71%	71%	73%	72%	72%	73%	72%	71%	73%

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



Unduplicated Sightings of Females with Cubs: In FY99, there were no confirmed unduplicated sightings of female grizzly bears with cubs in the Kootenai portion of the CYE (Kasworm 2000a). One female did produce cubs, but both she and her cubs were killed by another bear, and therefore, are not reported (refer to mortality discussion below). There likewise were no confirmed unduplicated sightings of female grizzlies with cubs in the Kootenai portion of the NCDE in FY99. Both ecosystems were below the 6 year average.

Distribution of Females with Young: One of the 17 BMUs on the Kootenai portion of the CYE was occupied by females with young in FY99. The total number of different BMUs occupied over the entire recovery zone during the past 6 years was 12, compared to the Recovery Plan goal of 18 (Kasworm 2000a). The one BMU in the Kootenai's portion of the NCDE was not known to be occupied by a female with young during the year. These numbers are lower than the 6 year average.

Mortality: There were 5 known mortalities in the CYE in FY99, two of which were human-caused (Kasworm 2000b). One of these was an adult female bear that was captured and radio-collared in the Yaak and later shot in self-defense by hunters in British Columbia. An adult female and her 2 cubs of the year were killed by another grizzly bear in the Yaak. An adult male bear in the Yaak was captured on private land and euthanized after instances of depredation at several private residences. Preliminary population trend analysis including the 1999 mortalities indicates that the grizzly bear population in the CYE may currently be stable to very slightly increasing (Kasworm 1999b). However, the confidence interval for this estimate also includes the possibility of a declining population. There were no reported grizzly bear mortalities in the Kootenai portion of the NCDE in FY99.

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

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

Fiscal Year	NCDE			CYE		
	# Females with Cubs of the year	#BMUs Occupied by Females with Young	# Human Caused Mortalities	# Females with Cubs of the year	# BMUs Occupied by Females with Young	# Human Caused Mortalities
1994	0	1	0	1	3	0
1995	1	1	1	1	3	0
1996	0	1	0	1	4	0
1997	2	1	*1	3	7	1
1998	2	1	0	0	4	0
1999	0	0	0	0	1	2
Six-year Average (total)	0.8	0.8	0.3	1.0	3.7 **12	0.5

*Outside Recovery Zone

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

Efforts continued in FY99 to develop access management guidance based on current scientific findings and social and other land management considerations as directed by the Interagency Grizzly Bear Committee (IGBC). The IGBC manager's subcommittees for the CYE and NCDE are currently working to refine access management guidance for the ecosystems based on the latest scientific information on the effects of human access on local grizzly bear populations. Interim options for analyzing access management parameters were tentatively agreed upon by these groups in December of 1998. A few NEPA decisions utilizing these options have now been implemented, and the results are compared to the 1998 baseline data in Table C-7-3. The interim monitoring elements include: core area, open motorized route density (OMRD), and total motorized route density (TMRD).

Core area: For all Priority 1 BMUs, the interim goal is to achieve 55 percent core area by January 2002. Where factors such as existing road jurisdiction, ownership patterns, and other conditions prevent achievement of a 55 percent core area, consultation with the USFWS will establish the appropriate core area amount. Core area will not apply for BMUs with less than 75 percent Federal ownership.

Motorized access route density: The interim objective is for no net increase in OMRD or TMRD on National Forest Lands within the recovery area, as measured by a moving window computer analysis technique. There are no new standards for OMRD or TMRD during the interim period (3 years, or until the Forest Plan is revised).

Salvage Sales: The Decision Notice for the Forestwide Blowdown Salvage project was approved on March 24, 1998. This decision established a special monitoring item to assure that the cumulative effects of projects implemented under this decision would meet management direction for grizzly bears. The focus of monitoring is on the opening of closed roads and the number of projects active at one time in each BMU. The decision requires that this item be reported for two years after the decision (FY98 and FY99). There were no projects implemented under the Blowdown decision in FY99 in Bear Management Units. All management direction for grizzly bears was met.

Table C-7-3 **Baseline conditions of Interim Access Management monitoring items (S/CY BMUs)**

Biological Rating*	BMU	FY98 Core %	FY99 Core %	FY98 % BMU OMRD >1mi/sqmi	FY99 % BMU OMRD >1mi/sqmi	FY98 % BMU TMRD >2mi/sq.mi	FY99 % BMU TMRD >2mi/sq.mi
1	**Snowshoe 2		77.2		18		15
1	*** Bull 4	60.2	60.2	39	39	28	28
1	Wanless 6	51.0	60.5	37	39	35	27
1	Silver Butte/Fisher 7	65.0	65.7	27	23	22	19
1	Roderick 11	52.3	52.2	32	36	31	31
1	** Newton 12		55.7		43		28
1	Keno 13	57.8	56.4	34	37	23	26
1	Northwest Peak 14	57.8	60	31	32	24	22
1	Garver 15	34.7	46.3	32	30	45	34
1	E Fk Yaak 16	38.3	39.7	38	36	45	42
2	Cedar 1	69.0	84.0	23	13	16	9
2	Saint Paul 5	60.4	61.4	29	28	23	21
2	** Callahan 9		32.6		36		31
2	Pulpit 10	42.0	44.7	50	50	41	37
2	Big Creek 17	32.0	39.7	43	36	44	42
3	** Spar 3		57.2		23		31
3	Vermilion 8	54.0	56.9	39	11	41	44

(Shaded entries indicate Priority 1 BMUs that were below 55 percent core area)

* biological rating: 1 = high priority, 2 = moderate, 3 = low (S/CY Subcommittee Access Management Rule Set : 12/98)

This rating is based on known grizzly bear use (especially females with cubs), if BMU is adjacent to a BMU that has a female with cubs, and if human caused mortality has occurred in BMU.

Summary: Grizzly bear habitat effectiveness improved overall compared to FY98, and is above the desired level of 70 percent Forest-wide. One additional BMU was brought up to the 70 percent habitat effectiveness level during the year, although some BMUs still remain below this level. Sightings of female grizzly bears with cubs was down in FY99, and the six year average was down as well. Likewise, fewer BMUs were occupied by females with young than in the previous year. There were two human caused mortalities, one in Canada and one on private land, during the year. There were three mortalities from natural causes on National Forest lands. Based on our analysis, grizzly bear habitat continues to improve in condition. Preliminary population trend analysis including the 1999 mortalities indicates that the grizzly bear population in the CYE may be stable to very slightly increasing (Kasworm 1999).



White Sturgeon -- The USFWS Recovery Plan for the Kootenai River white sturgeon was signed 30 September, 1999. The short-term goals of the Plan are to reestablish natural reproduction and prevent extinction of the species. Long term goals include providing suitable habitat conditions and restoring a natural age-class structure and an effective population size. This stock of fish will be considered for downlisting to threatened status after 10 years only if natural reproduction occurs in three different years; the estimated population is stable or increasing; enough captive-reared juveniles are added to the population for 10 consecutive years that 24 to 120 juveniles survive to maturity; and a long-term Kootenai River Flow strategy is implemented that ensures natural reproduction. Delisting of this population is estimated to take at least 25 years following the approval of the Plan.

The Recovery Plan for the white sturgeon outlines a comprehensive set of actions needed to begin the recovery process. The Plan does not identify actions or objectives that directly affect management of the Kootenai National Forest. However, under the Endangered Species Act (Section 7(a)(1)), the Forest is obligated to use its authorities to aid in the recovery process and to consult with the USFWS on all proposed or authorized activities. The Roderick Ecosystem Burns Project May Affect but is Not Likely to Adversely Affect the white sturgeon. All other projects and activities evaluated by the Forest in FY99 were found to have No Effect on the species.

The current population estimate from the Idaho Department of Fish and Game indicates there are approximately 1,469 adult sturgeon in the population. Fish radio-tagged in FY99 migrated from Kootenay Lake, British Columbia into the Ferry Island Reach, Idaho. These fish are potential spawners. There was also one wild juvenile from the 1997 cohort that was captured which indicates that there was successful spawning in 1997. Ages of wild fish captured in FY99 ranged from 1 to 49 years.

Bull trout -- The Kootenai National Forest continues to consult with the USFWS on all ongoing activities under Section 7(a)(1) of the Endangered Species Act. During FY99 the Forest consulted on all proposed activities. The Forest has worked closely with the five other western Montana National Forests, Bureau of Land Management and the USFWS to develop Programmatic Biological Assessments for stream surveys, road maintenance, timber stand improvement, trail maintenance, and recreational site maintenance. The Forest is also preparing watershed baselines for the four sub-populations supported on Kootenai National Forest lands for submission to the USFWS.

There were four new projects that were evaluated by the Forest that May Affect but are Not Likely to Adversely Affect bull trout. The Sterling Rock Creek Mine Proposal was resubmitted for formal consultation after the Forest changed its effects determination to May Affect, Likely to Adversely Affect bull trout. The remainder of new projects evaluated were determined to have No Effect on the species. As consultation progresses, so will the recovery process. The Forest continues to work

closely with Montana Fish Wildlife and Parks as well as the USFWS to determine distribution and abundance of bull trout within the boundaries of the Kootenai National Forest. From this data the USFWS will determine present status of the four affected subpopulations on the Forest.

The Forest is actively participating with the State and the USFWS to develop the Recovery Plan for bull trout in both the upper Kootenai and the lower Clark Fork Rivers. The Forest has been an active participant on both Recovery Unit Teams. The Forest is actively pursuing watershed improvement projects with the intent of improving bull trout habitat and aiding recovery.

Recommended Actions: Based upon the best available information, populations of all threatened or endangered species on the Kootenai are stable or increasing. The peregrine falcon has recovered and has been removed from the endangered species list. The bald eagle is likewise proposed for removal from the list. All of the threatened and endangered species' habitats being monitored appear to be maintaining or improving. The information shows that the Kootenai National Forest is progressing toward providing adequate habitat for threatened and endangered species recovery. Based on review of this item, specific changes to Forest Plan direction are not needed at this time.

As with the terrestrial species, the two ESA-listed species of fish on the Forest appear to be increasing in number. Ongoing population research on the white sturgeon determined that there was successful spawning in 1997 as well as establishing a higher estimate of individuals in the population. Furthermore, a recovery plan is now in place with specific goals and recovery actions. Bull trout redd count numbers were commensurate with numbers collected in FY98. Redd count numbers provided by Montana Fish Wildlife and Parks continue to show stable or increasing numbers of bull trout across the Forest. This information indicates the Forest Plan as amended by INFS is providing adequate protection to the aquatic threatened and endangered species and habitat found on the Forest. This is consistent with findings in the recent Supplemental Draft Environmental Impact Statement issued for the ICBEMP. Based on this review, specific changes to the Forest Plan are not needed at this time for the further protection of threatened and endangered aquatic species.

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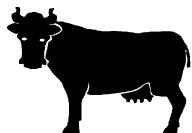
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RANGE: Range Use; Monitoring Item D-1

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 active allotments located mostly in the northeastern portion of the Forest on the Rexford and Fortine Ranger Districts. Currently, the Forest has 44 grazing allotments, of which 22 are active. The allotments have a ten year permit period. All of the allotments but two have had NEPA analysis completed and Management Plans written and updated since 1996. The two remaining allotments are scheduled to be updated in Fiscal Year 2001. The Swamp Creek allotment no longer exists because it was part of a land exchange.

Results: In FY 1999 there were 7,796 AUMs of grazing use on the Kootenai National Forest (see Table D-1-1). This is 62 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	FY99 Use	12 Year Average
AUMs	12,600	7796	10,843
Percent	100%	62%	86%

Evaluation: During the last twelve years, grazing use has averaged 86 percent of projected use, which is within the range anticipated in the Plan. Permittee requests for non-use and Forest requests to defer grazing to prevent overgrazing in riparian areas and to prevent stream bank deterioration account for being lower than the Forest Plan projection. All the allotments on the Kootenai National Forest consist of transitory range. Generally, there is plenty of forage within the allotments. The biggest problem is that the cattle congregate in openings and in riparian areas, which in effect become “sacrifice” areas. Also, these openings usually “convert” to Kentucky bluegrass sites, which continually attract the animals. On transitory range it is very difficult to move and/or to keep animals spread over the entire allotment.

Recommended Action: In review of this monitoring item, no changes are needed to the Forest Plan at this time. During Forest Plan Revision, the status of allotments will be reviewed. This item will continue to be monitored.

RANGE: Noxious Weed Infestations; Monitoring Item D-2

ACTION OR EFFECT TO BE MEASURED:	Determine acreage infested with noxious weeds.
VARIABILITY, WHICH WOULD INITIATE FURTHER EVALUATION	10% increase in number of acres infested, 10% increase in density of existing infestations or a change in the diversity of noxious weed species



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

Background: The Forest Plan states that noxious weed infestations will be monitored for increases in total acreage, increases in weed density and the introduction of new weed species on the Forest. Weed infestations have been established along many roadsides, railroad and powerline rights-of-way and other disturbed areas such as gravel pits. Spotted knapweed and others have started to migrate away from the road right-of-way onto undisturbed hillsides, especially within the drier vegetation types. Most of the weeds are brought here attached to machinery, automobiles, railcars, etc. The Kootenai Forest classifies weeds into four categories which includes all the species listed by the State of Montana and Lincoln County. Several species have been added to the list including those that the State of Montana added to the list. Table D-2-1 shows the types of weeds, and the category they are in, that occur on the forest. The Forest has prepared an Herbicide Weed Control Environmental Assessment (EA) (1997). Nomenclature for vascular plants follows Hitchcock and Cronquist (1973) and for bioagents follows Rees et al. (1996).

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

Existing weed infestations have expanded greatly over the past 10 years. The most common weed on the KNF is spotted knapweed. Canada thistle is also common, but isn't as widespread. In 1995, county weed specialists estimated that knapweed infested over 200,000 acres across the forest (Hirsch and Leitch 1996). Two-thirds of the total infestations are in rangelands, wildlands, or forest lands; the remaining third was in road or railway corridors. The most widespread infestations are in the Clark Fork, Fisher River, and Kootenai River valleys.

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

Category	Status	Threat	Goal	Species Included
Group Ia. Potential Invaders	not known to exist	high probability of causing severe economic or environmental damage	prevention, eradication	yellow starthistle (<i>Centaurea solstitialis</i>), common crupina (<i>Crupina vulgaris</i>), Dyer's woad (<i>Isatis tinctoria</i>), purple loosestrife (<i>Lythrum salicaria</i>), eurasian milfoil (<i>Myriophyllum spicatum</i>)
Group Ib. New Invaders	small populations at limited sites	high probability of causing severe economic or environmental damage	eradication	whitetop (<i>Cardaria draba</i>), musk thistle (<i>Carduus nutans</i>), Russian knapweed (<i>Centaurea repens</i>), rush skeletonweed (<i>Chondrilla juncea</i>), blueweed (<i>Echium vulgare</i>), leafy spurge (<i>Euphorbia esula</i>), Japanese knotweed (<i>Polygonum cuspidatum</i>), tansy ragwort (<i>Senecio jacobaea</i>)
Group II. Existing populations	large, widespread populations	high probability of causing environmental or economic damage	containment within already infested areas, reduction of plant populations	diffuse knapweed (<i>Centaurea diffusa</i>), spotted knapweed (<i>Centaurea maculosa</i>), oxeye daisy (<i>Chrysanthemum leucanthemum</i>), Canada thistle (<i>Cirsium arvense</i>), orange hawkweed (<i>Hieracium aurantiacum</i>), meadow hawkweed (<i>Hieracium pratense</i>), St. John's-wort (<i>Hypericum perforatum</i>), dalmatian toadflax (<i>Linaria dalmatica</i>), yellow toadflax (<i>Linaria vulgaris</i>), sulfur cinquefoil (<i>Potentilla recta</i>)
Group IIIb. Existing infestations (watch)	variable, some new, some well established	Unknown but high probability of causing environmental and economic damage	containment within already existing areas, reduction of plant populations, monitor	absinth wormwood (<i>Artemisia absinthium</i>), meadow knapweed (<i>Centaurea pratensis</i>), bull thistle (<i>Cirsium vulgare</i>), poison hemlock (<i>Conium maculatum</i>), field bindweed (<i>Convolvulus arvensis</i>), hound's tongue (<i>Cynoglossum officinale</i>), Scot's broom (<i>Cytisus scoparius</i>), spotted cat's-ear (<i>Hypochaeris radicata</i>), kochia (<i>Kochia scoparia</i>), common tansy (<i>Tanacetum vulgare</i>)

The spread of weeds has become very noticeable on winter game ranges, especially to the east of Libby. An example, the “horse range” behind (north) Canoe Gulch Ranger Station is estimated to have lost 70-80 percent of its effectiveness as winter range. Most of the encroachment has been by spotted knapweed. Knapweed is less widespread in the Tobacco Valley because of earlier weed control programs that included the use of herbicides (1986 Noxious Weed Treatment Program Final Environmental Impact Statement allows the use of herbicides on the Rexford and Fortine Ranger Districts). KNF specialists estimate that approximately 250,000 acres are at moderate or high risk of infestation by spotted knapweed.

Inventory: Two hundred eighty-four weed surveys were completed last summer (FY99). Table D-2-2 summarizes the percent of a weed species found within each survey. The surveys note each noxious weed species seen in the survey (from the Kootenai National Forest list of weed species) as well as the predominant infestation size and cover class, or density, of each species. Weeds listed on the table below are those currently being tracked by the Kootenai National Forest. This list tiers to the Montana and Lincoln County Noxious Weed Lists and includes other species of concern on the Forest. Two types of surveys were conducted last summer. One was a road survey specifically looking for rush skeletonweed. It also noted the presence or absence of other weed species. The second survey type was an area survey confined to the upper Little Wolf Creek drainage specifically to locate tansy ragwort plants.

Table D-2-2 information was tabulated from the rush skeletonweed road surveys. These surveys also indicated the typical size of infestation and the average cover class or density of plants. These surveys were conducted along both open and closed roads. Infestation sizes were noted and characterized as one of the following: <.1 acre, .1 to 1 acre, 1 to 5 acres, and > 5 acres. Cover classes (plant densities) were characterized as either trace (<1%), low (1 to 5%), medium (6 to 25%), or high (>25%). The total number of noxious weed species noted in the road surveys is 17. Thirteen additional species are known to occur on the Forest. Eleven new sites of rush skeletonweed were located. Over 600 miles of road were inventoried.

Approximately 4500 acres were surveyed and mapped for tansy ragwort. Both the size and density were noted and provided the basis for the spraying of tansy. The tansy ragwort population was originally confined to the upper Little Wolf area on the KNF and the upper Good Creek area of the Flathead National Forest. It was hoped that it could be contained to these areas. It is now being found up to 20 air miles away. Several new sites were found again last season.

Change over time can be measured by observing changes in % of surveys with each species present, and by observing changes in the most common size and density of those populations. Table D-2-2 also shows that spotted knapweed, St. John's-wort, meadow hawkweed, Canada thistle, orange hawkweed, and oxeye daisy are the most common weed species present on the Kootenai National Forest, all having been recorded on over 30% of the surveys conducted. Canada thistle and spotted knapweed are the most common noxious weed species on the Forest. Many weed species are just becoming established on the Kootenai National Forest, such as rush skeletonweed, blue weed, chicory, kochia, and Dalmatian and yellow toadflaxes. St. John's-wort, orange hawkweed, rush skeletonweed, common tansy, and oxeye daisy all appear to be more common on the west side of the Forest, whereas, absinth wormwood, meadow hawkweed, hound's-tongue, musk thistle, and tansy ragwort are more common on the east side. Diffuse knapweed, Russian knapweed, Scotch thistle, kochia, leafy spurge, and Scot's broom have been found on the Forest, but were not recorded in this year's surveys.

Table D-2-2 Percent of Weed Species found in FY99 Surveys

Species (<i>Six Letter Code</i>)	% of Surveys with this Species	Predominant Infestation Size	Predominant Cover Class
ι Potential Invaders			
Yellow starthistle (<i>Censol</i>)			
Common crupina (<i>Cruvul</i>)			
Dyers woad (<i>Isatin</i>)			
Purple loosestrife (<i>Lytsal</i>)			
Eurasian milfoil (<i>Myrspi</i>)			
Ϸ New Invaders (small populations)			
Whitetop (<i>Cardra</i>)	*		
Musk thistle (<i>Carnut</i>)	*		
Russian knapweed (<i>Cenrep</i>)	*		
Rush skeletonweed (<i>Chojun</i>)	11	<.1 acre	trace
Blue weed (Viper's bugloss) (<i>Echvul</i>)	<1	<.1 acre	trace
Leafy spurge (<i>Eupesu</i>)	*		
Japanese knotweed (<i>Polcus</i>)	*		
Tansy ragwort (<i>Senjac</i>)	4	<.1 acre	high
! Existing Infestations			
Diffuse knapweed (<i>Cendif</i>)	*		
Spotted knapweed (<i>Cenmac</i>)	42	***	***
Oxeye daisy (<i>Chrleu</i>)	50	***	medium
Canada thistle (<i>Cirarv</i>)	70	**	**
Orange hawkweed (<i>Hieaur</i>)	40	<.1 acre	high
Meadow hawkweed (<i>Hiepra</i>)	30	<.1 acre	medium-high
St. John's-wort (<i>Hypper</i>)	34	***	medium
Dalmatian toadflax (<i>Lindal</i>)	5	<.1 acre	trace
Yellow toadflax (<i>Linvul</i>)	3	<.1 acre	trace
Sulfur cinquefoil (<i>Potrec</i>)	6	<.1 acre	trace
'b. Species of Undetermined Status			
Absinth wormwood (<i>Artabs</i>)	8	<.1 acre	trace
Meadow knapweed (<i>Cenpra</i>)	<1	<.1 acre	low
Bull thistle (<i>Cirvul</i>)	*		
Poison hemlock (<i>Conmac</i>)	*		
Field bindweed (<i>Conarv</i>)	*		
Hound's-tongue (<i>Cynoff</i>)	7	<.1 acre	trace
Scot's broom (<i>Cytsco</i>)	*		
Spotted cat's-ear (<i>Hyprad</i>)	2	<.1 acre	trace
Kochia (<i>Kocsco</i>)	*		
Common Tansy (<i>Tanvul</i>)	27	<.1 acre	trace

* Species known to occur on the KNF or Lincoln County but not noted on any surveys.

** = indicates that the lower three categories of size and cover class are well represented.

*** = indicates that all infestation size and cover class categories are well represented.

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

Weed Category	Infestation Size				Infestation Density			
	% <.1 acre	% .1-1 acre	% 1-5 acres	% >5 acres	% Trace	% Low	% Medium	% High
Potential Invaders	0	0	0	0	0	0	0	0
New Invaders	100	0	0	0	80	2	2	16
Existing Infestations	39	16	21	24	19	21	36	32
Watch Species	57	21	14	8	46	24	22	8
Overall Average	48	17	18	17	31	17	28	23

Table D-2-3 describes the average infestation size and density for each of the weed categories (New Invader, Existing Infestation, etc.) and then gives the overall average for all weeds tracked by the Forest. This table shows that the majority of weed populations noted (48%) are found in populations of less than .1 acre and (31%) in densities of trace. However, weeds in the existing infestation category are more evenly spread throughout the size and density categories, showing that they have not remained in the smaller size classes and densities, but rather trend toward larger populations and higher densities if left unchecked.

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

CONTROLS

Biological Agents

Implementation

The KNF's present weed management program is an Integrated Pest Management (IPM) approach that combines prevention, education, and biological, mechanical, cultural, and chemical control of weeds. Biological control (biocontrol) has been the primary method of weed control across much of the forest. Since 1987, the KNF, in cooperation with the Western Agricultural Research Center (WARC), has made approximately 100 releases (Table D-2-4) of biocontrol agents. Most of these releases have been targeted at control of spotted and diffuse knapweed, though several biocontrol agents for St. John's-wort, Canada thistle, and toadflax have also been released. The releases have been made in approximately 75 different locations. Some releases have been made in the same sites to help build the populations faster in these areas.

The banded gallfly (*Urophora affinis*) was released in Montana and Oregon in 1973. This bioagent attacks the seed heads of spotted knapweed. It has survived and become established to the point where it can be found throughout much of the Forest.

About 6700 insects were released at 15 different sites on the KNF last summer. There were a total of seven bioagents. Five (sulphur knapweed root moth, knapweed root weevil, lesser knapweed flower weevil, knapweed seed head moth, and gall fly) of the agents were host specific for the knapweeds, especially spotted and diffuse. The other bioagents, ragwort seed fly and the cinnabar moth, were released on the tansy ragwort infestation area.

The effect of these releases has been minimal thus far, although the bioagent populations have been building and the increase in weeds has slowed in some areas. Biocontrol has not measurably reduced populations of knapweed, St. John's-wort, Canada thistle, or toadflax on the KNF, probably because populations of the biocontrol agents are still very small relative to the size of the weed infestations. There is observational evidence that seedhead flies have slowed the rate of knapweed spread and, with continued releases and reproduction, these and other biocontrol insects may, over time, begin to reduce existing weed populations. However, it is unlikely that biocontrol agents will cause any widespread reduction of spotted knapweed for at least 10 years, during which time spotted knapweed, St. John's-wort, toadflax, and other existing infestations will continue spreading (Herbicide Weed Control EA 1997).

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

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

Effectiveness:

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

Herbicide Application

Implementation:

In 1999 a total of 1427 acres were treated with herbicides to control rush skeletonweed, spotted knapweed, canada thistle, Dalmatian and yellow toadflax, leafy spurge, absinth wormwood, and tansy ragwort specifically. These applications also reduced populations of diffuse knapweed, sulfur cinquefoil, oxeye daisy, St. John's wort, orange hawkweed, and meadow hawkweed. In the last eight years 6367 acres have been sprayed for spotted knapweed, leafy spurge, dalmation and yellow toadflax, rush skeletonweed, tansy ragwort, Russian knapweed, and diffuse knapweed.

Effectiveness:

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

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

Mechanical and Cultural

Implementation:

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

Effectiveness:

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

Hand-pulling, which is the principal method of mechanical control used on the KNF, has been effective on individual plants of some species or very small, isolated weed populations. Attempts to hand-pull large infestations of knapweed and toadflax have provided only temporary control because

seeds remain viable in the soil for up to 12 years. Hand-pulling is completely ineffective on weeds with deep taproots and weeds which reproduce through runners or shoots, such as rush skeletonweed and leafy spurge. Pulling these species stimulates growth in the roots and fragments which remain in the soil, resulting in more plants instead of less (Herbicide Weed Control EA 1997).

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

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

Recommended Actions: Prior to 1997 emphasis in weed control focused on the use of biological and cultural controls (cultural control uses plant competition to maintain or enhance desired plants) on the southern part of the Forest and the use of herbicides on the north end of the Forest. In 1996, a Noxious Weed Control Provision was added to the timber sale contracts. In 1997, the Herbicide Weed Control EA was issued giving the Forest the ability to use a more integrated approach to controlling weeds. These actions are occurring under the direction of the Forest Plan and should help improve the noxious weed situation on the Forest. It is recommended that no changes are needed in the Forest Plan at this time.

Future Actions: The KNF *Noxious Weed Handbook* is being updated to include nine more noxious weed species. The additions include the species that the State of Montana added to their list in January of 2000 plus others that are being observed on the KNF. The species are plumeless thistle, bugloss, dwarf snapdragon, scotch thistle, common burdock, germander speedwell, common speedwell, tall ranunculus, and tamarisk spp. These species will also be added to the field transect form. A new category is also being added. It will be labelled ***Ic New Invaders (medium populations)*** and will have a status of *medium populations at limited sites*.

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

ACTION OR EFFECT TO BE MEASURED: Determine if the sell volume meets the projections of the Forest Plan, including other permissible sale volumes.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: +/- 5 percent deviation for the ASQ volume, and +/- 10 percent deviation for the other permissible volumes.



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

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

Results: Table E-1-1 shows that sell volumes have declined from approximately 200 MMBF/yr to about 80 MMBF per year between FY 88 and FY99. The average yearly amount sold has been 111.4 MMBF from suitable lands, and 1.5 MMBF from unsuitable lands. In total, this amounts to 112.9 MMBF average per year for the past twelve years. This actual sell volume is well below the ASQ limit as set in the Plan.

Evaluation: After 12 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 which 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 volume sold in FY99 is slightly above FY98, but still lower than that for the preceding years.

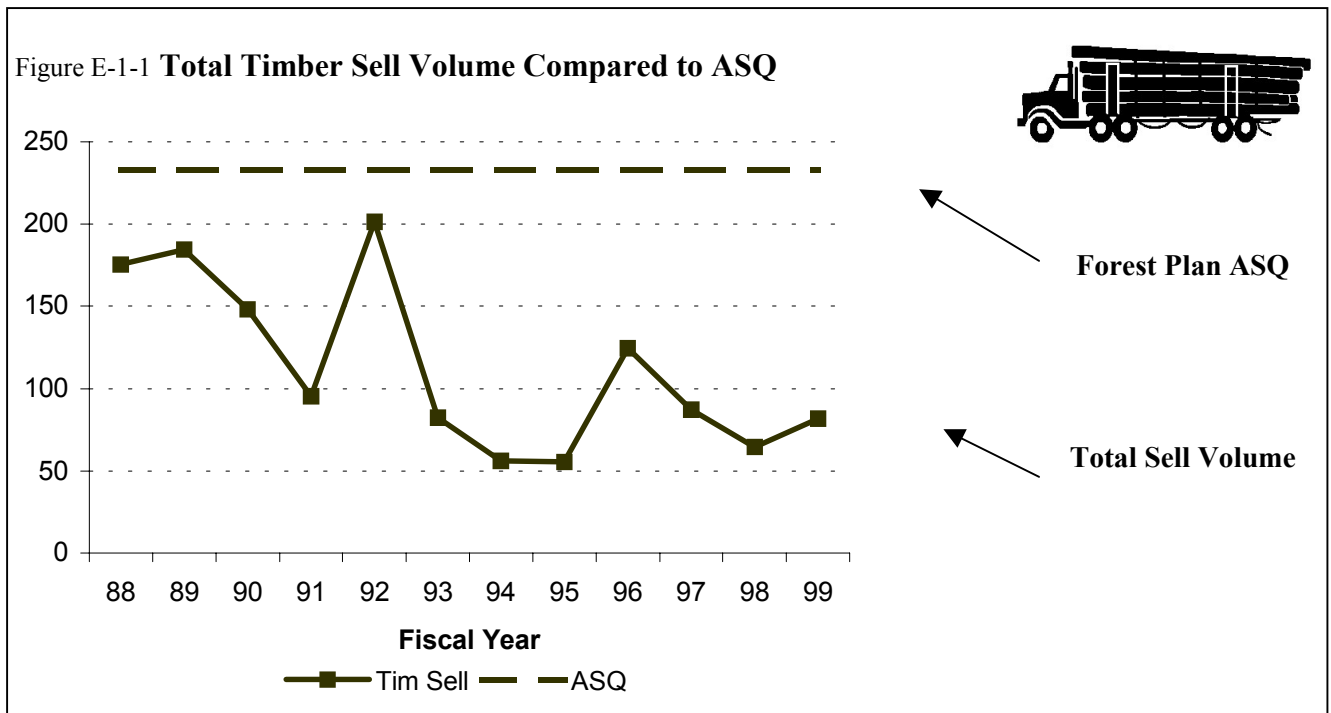
In November 1995, the Chief of the Forest Service issued a decision on a Forest Plan appeal related to a technical error in the calculation of the Forest's ASQ. The issue centered on how timber age classes were cataloged in the inventory information used to calculate ASQ. A description of the problem 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. In response, in November, 1996 the Forest issued a Notice of Intent to revise the Forest Plan. Since that time, the Forest has been preparing data and training personnel to facilitate formal preparation of a revised Plan. Due to a lack of funding from the National and Regional level, no formal documents have been completed towards Forest Plan revision.

In the past few years, additional factors have influenced the timber sales program. The most significant was additional streamside protection measures as required by the Inland Native Fish (INFS) Decision of July, 1995. Also, the USFWS amended biological opinion for grizzly bear recovery was issued July, 1995 and changed how recovery processes would take place on the Forest. In general, it has become more difficult to plan and execute sales due to public controversy and scheduling requirements necessary to meet resource needs.

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

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

	Forest Plan Annual ASQ Projection	Average Sell Volume FY 88-92	Average Sell Volume FY93-97	FY 1998	FY 1999
Suitable Lands	227	159	81	61.6	79.8
Unsuitable Lands	6	2	0.4	2.8	1.9
Total Timber Sell Program	233	161	81.4	64.4	81.7



Recommended Actions: The Forest has not exceeded the ASQ in 12 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. This will be a part of the initial issues for scoping during the revision of the Forest Plan.

TIMBER: Acres of Timber Sold for Timber Harvest; Monitoring Item E-2

ACTION OR EFFECT TO BE MEASURED: Determine if the regeneration harvest acres meet Forest Plan projections by management area.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: +/- 10% by management area.



Purpose: This monitoring item was established to help ensure that harvest acreages and volumes sold are closely correlated. The Forest Plan requires that this monitoring item be reported annually. The expected accuracy and reliability of the information are both high.

Background: The acres to be harvested as projected by the Plan are located in six different management areas (MAs). Since each MA has different objectives and management standards, the expected costs of timber harvest will vary. Any significant deviation from the expected harvest acreage for each MA could indicate possible changes in costs, benefits, budget requirements, or environmental effects. (For more information on the Forest Plan MA requirements, see Chapters II and III of the Plan.)

The Plan projects 15,740 acres of annual regeneration harvests to achieve the ASQ. Regeneration harvests include clear cut, seed tree, and shelterwood cutting methods. Salvage and sanitation cuts are not included in the acreage figure.

Results: Table E-2-1 shows the acres sold for regeneration harvest by MA for the first twelve years of implementation and for FY99. During FY99, the general downward trend which had been apparent in most years remained in place. The acreage sold for regeneration harvest is highest for MA 15, while five other suitable timber MAs (11, 12, 14, 16, and 17) continued to be well below Forest Plan projected amounts. Additional harvest occurred in FY99, but was either salvage or intermediate harvest that did not result in a regenerated stand.

For the first twelve years of implementation, MA 11 and 15 were closest to the projected harvest amounts while MA 12, which is managed for a combination of timber and big game habitat, has the largest average acreage deviation. MA 14 and 16 show large percentage differences between projected and actual, although the acreage planned for regeneration harvest in these areas is much less than that planned for MA 12. Very little regeneration harvest was accomplished in MA 17 lands; however, relatively little was projected. As additional monitoring continues, it will be possible to see if the second decade of implementation is different than the first.

Evaluation: Many of the factors affecting this monitoring item are similar to those affecting item E-1, Allowable Sale Quantity. As stated in the evaluation for that item, wildlife habitat management, watershed concerns, litigation, appeals, deferrals, and changes in management area designation (particularly designation of old growth management areas from suitable timber harvest MAs) have all affected the potential to meet the Plan's projected regeneration harvest.

Table E-2-1 **Acres of Timber Sold for Harvest by Fiscal Year (Regeneration Harvest Methods Only)**

MA	FP Projection	10-Yr Average (1987 - 1997)	% of Projected (1987 - 1999)	FY 98 Acres Sold	FY 98 % of Projected	FY 99 Acres Sold	FY 99 % of Projected
11	690	430	62%	11	2%	40	6%
12	8,800	3,270	37%	593	18%	187	2%
14	1,220	251	21%	0	0%	16	1%
15	2,050	2,184	107%	975	48%	429	21%
16	2,520	469	19%	0	0%	175	7%
17	460	56	12%	0	0%	36	8%
Total	15,740	6,661	42%	1,579	10%	883	6%

Since harvest has focused on MA 15 lands throughout the implementation of the plan, it indicates that there are efficiencies present for that MA that are not present for the other MAs. Assessment work for Forest Plan revision will need to determine both future opportunities for MA 15 and the problems, which prevented greater utilization of the other management areas for timber harvest. One other factor in the decline in acres sold for harvest through regeneration methods is the strong trend away from regeneration harvest to more intermediate cuts, salvage and individual tree harvest methods.

Recommended Actions: It is apparent that the acres sold for regeneration harvest will not meet the acreage projected in the Forest Plan. This is a result of many factors that are influencing the Forest's timber sales program (see E-1 for details). The upcoming revision of the Plan will provide the opportunity to assess appropriate levels of harvest volume and acreage.

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

ACTION OR EFFECT TO BE MEASURED:

Determine if significant cumulative changes are occurring in the suitable timber base by tracking management area boundary changes.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:

+/- 5,000 acre cumulative total change in any suitable timber management area.



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

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

Evaluation: Table E-3-1 displays the net MA acreage changes in suitable timberland for the last eleven years (FY 88-99) and the net change in all suitable timberland. Acreage losses occurred in MA 14, 15 and 16, while MA 11 and 12 gained acreage in FY99. Total net loss in the suitable timberland in FY99 was 3,148 acres. Table E-3-1 shows this information for the largest unsuitable MAs. Most of these MA changes were made in the process of designating MA 13 and other old growth management areas. The pattern of change has been fairly consistent in both magnitude and direction. This monitoring item is outside the prescribed range for MAs 11, 15 and 16 (more than 5,000 acres of change). The remaining suitable timber MAs are within evaluation limits (MAs 12, 14, 17).

Recommended Actions: The degree to which changes have been made to management area designations indicate continuing validation of Forest Plan data. The large change in the suitable management area category (over 60,000 acres) amounts to approximately three percent of the total suitable base. At this time, it is not apparent that this is significant in terms of the calculation of the long term sustainability of the timber harvest program or ASQ. During revision of the Forest Plan, sustainability and ASQ calculations will be made using the validated management areas. This will allow for an assessment of the effect of changed management area designations.

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

Fiscal Year	MA 11	MA 12	MA 14	MA 15	MA 16	MA 17	Total Chg to Suitable MAs
1988	330	0	1,070	(1,760)	(510)	0	(870)
1989	(1,142)	(345)	386	253	(22)	(48)	(918)
1990	(164)	(420)	(130)	(4,273)	916	(661)	(4,732)
1991	78	(442)	(1,050)	(3,188)	(1,414)	(281)	(6,297)
1992	(9,279)	(3,178)	(196)	(1,711)	(1,498)	(323)	(16,185)
1993	(1,329)	1,000	(705)	(7,444)	(2,271)	22	(10,727)
1994	(109)	(402)	106	524	111	(148)	82
1995	(457)	1,441	131	(1,845)	(193)	0	(923)
1996	(1,370)	2,743	(206)	(1,679)	229	440	157
97CLE*	(127)	(2,030)	2,392	(8,680)	(2,689)	(494)	(11,628)
97 other	(2,215)	2,168	(66)	(5,055)	(625)	366	(5,427)
1998	(827)	(1,075)	(1,432)	90	75	(60)	(3,229)
1999	316	1,434	(648)	(1,281)	(1,801)	(1,168)	(3,148)
Total Net Chg to MA	(16,295)	894	(348)	(36,049)	(9,692)	(2,355)	(63,845)

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

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

Fiscal Year	MA 2	MA 10	MA 13	MA 18	MA 19	MA 24	Total chg to Unsuitable MA's
1988	240	1,670	(500)	190	(280)	480	1,800
1989	842	0	(149)	32	135	100	960
1990	150	1,080	1,877	381	(950)	2,564	5,102
1991	1,009	574	4,135	(140)	(231)	1,724	7,071
1992	196	3,211	7,980	2,656	231	823	15,097
1993	(338)	374	7,931	(595)	(2,115)	2,618	7,875
1994	(173)	(69)	914	(437)	(294)	177	118
1995	181	(643)	1,788	(657)	112	(128)	653
1996	32	(550)	3,290	(1,725)	(630)	(649)	(232)
97 CLE*	12,777	(149)	(2,249)	(417)	(464)	(1,581)	7,917
97 other	109	(550)	8,501	(1,625)	(644)	(165)	5,626
1998	37	(170)	2,797	(56)	(108)	(113)	2,387
1999	(131)	366	3587	(145)	(343)	(331)	3003
Total Net chg to MA	14,931	5,144	39,902	(2,538)	(5,581)	5,519	57,377

Unsuitable MAs are used for areas where timber production is not a primary consideration; for example, MA 2 is Roadless Recreation; MA 10 is big game winter range not suited for timber production; MA 13 is protected old growth habitat; MA 18, 19, and 24 are lands with little timber value or lands difficult to regenerate (rocky areas, steep slopes). Other unsuitable MAs identify Wilderness, Special Interest Areas, Administrative Sites, etc. Included within unsuitable MAs are areas of inventoried old growth not identified as MA 13.

NOTE: The differences displayed in the Fiscal Year totals and the Total MA Changes in the two tables shown above are the result of eight additional MAs which contain some minor changes (usually less than 200 acres each) plus the lands that have been acquired and disposed of in the land exchanges completed during the years since the Forest Plan was approved. In FY95 and FY96, there were also changes to all MAs due to the process of converting to GIS.

TIMBER: Timber Harvest Deferrals; Monitoring Item E-7

ACTION OR EFFECT TO BE MEASURED: Determine the suitable timber acreage deferred from timber sales because of economics, resource conflicts, or other unforeseen reasons.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: More than 10,000 acres cumulative change in any suitable management area (MA).



Purpose: This monitoring item was also established to help ensure that the allowable sale quantity (ASQ) is reasonable. Any significant changes in the acreage available for timber harvest could affect the ASQ because it was determined by estimating the maximum amount of available harvest acreage in the first decade while still meeting all the required Forest Plan standards. The Plan requires that this item be reported annually. The expected accuracy and reliability of the information are both moderate.

Background: To determine the effect of harvest deferrals on the timber sale program, monitoring is done in two different categories. **Category A** deferrals are those that result from our project-specific conclusions about resource or economic conflicts that were not adequately accounted for in the Plan. Examples are road construction that is too expensive or a threatened, endangered, or sensitive species found which was unknown during Forest Planning. **Category B** deferrals are those that result from an externally imposed situation. Examples include appeals and court injunctions or significant timber harvest on adjacent private land which could exceed thresholds and may degrade watersheds if the Kootenai Forest timber is harvested before adequate watershed recovery occurs on the private land. Please note that suitable timber acres rescheduled from one year to a later year within the 15 year period are not considered deferred.

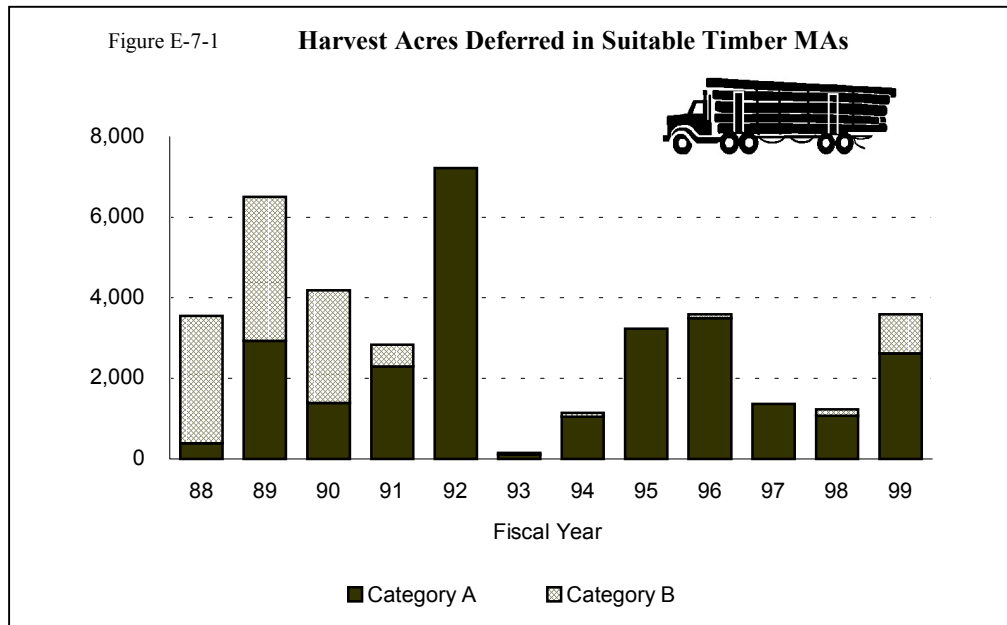


Table E-7-1 Deferred Harvest Acres by suitable Management Area (MA)

Category and Fiscal Year	MA 11	MA 12	MA 14	MA 15	MA 16	MA 17	Total
Category A							
88	15	340	25	0	0	0	380
89	95	2,434	68	196	138	0	2,931
90	89	779	107	120	298	0	1,393
91	204	1,629	360	38	60	0	2,291
92	66	4,886	2,186	76	0	0	7,214
93	0	106	0	0	0	0	106
94	0	77	963	0	0	0	1,040
95	8	1,449	0	936	842	0	3,235
96	0	3,257	234	0	0	0	3,491
97	23	1,163	173	0	0	0	1,359
98	716	44	195	101	19	0	1,075
99	1,738	241	281	158	75	129	2,622
Subtotal Cat. A	2,954	16,405	4,592	1,625	1,432	129	27,137
Category B							
88	0	2,580	274	314	0	0	3,168
89	198	2,274	301	766	30	8	3,577
90	403	912	62	1,164	168	80	2,789
91	7	60	0	427	50	0	544
92	0	0	0	0	0	0	0
93	0	33	0	0	11	0	44
94	0	0	0	0	0	97	97
95	0	0	0	0	0	0	0
96	0	95	0	0	0	0	95
97	0	0	0	0	0	0	0
98	0	0	0	154	0	0	154
99	0	419	0	0	500	54	973
Subtotal Cat. B	608	6,373	637	2,825	759	239	11,441
Totals A and B							
88	15	2,920	299	314	0	0	3,548
89	293	4,708	369	962	168	8	6,508
90	492	1,691	169	1,284	466	80	4,182
91	211	1,689	360	465	110	0	2,835
92	66	4,886	2,186	76	0	0	7,214
93	0	139	0	0	11	0	150
94	0	77	963	0	0	97	1,137
95	8	1,449	0	936	842	0	3,235
96	0	3,352	234	0	0	0	3,586
97	23	1,163	173	0	0	0	1,359
98	716	44	195	255	19	0	1,229
99	1,738	660	281	158	575	183	3,595
FY 88-97 TOTALS	3,562	22,778	5,229	4,450	2,191	368	38,578

Results: Table E-7-1 displays deferred harvest acres by category for each suitable timber management area on the Forest for FY 88-99. In FY99, 2,622 acres in Category A were deferred, and 973 were deferred in Category B.

Evaluation: For FY99, more acres were deferred in **Category A** in comparison to several preceding years. Deferrals took place due to a variety of reasons, including potential impact to watershed, fisheries, and roadless resources, economically unfeasible harvest units, or difficulty in finding an appropriate logging system to fit the situation.

Table E-7-1 shows that for the entire period from FY 88-99, 38,578 acres were deferred for both A and B categories. The largest amount for a single MA is 22,778 acres that were deferred in MA 12. This is the largest amount of all the MAs and is beyond the prescribed evaluation range of 10,000 acres. MA 11, 14 and 15 also had large amounts of harvest deferred, although they did not exceed the 10,000-acre evaluation range.

Recommended Actions: This item indicates that many more factors affect harvest than was accounted for during the preparation of the Forest Plan. Since the Forest now has detailed records of such factors, it will be more able to assess those effects during Plan revision. These factors will continue to be monitored, and brought forward in the revision process.

TIMBER: Harvest Area Size; Monitoring Item E-8

ACTION OR EFFECT TO BE MEASURED:	Cutting unit size by forest type, management area, and District.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Variation in trends of other resources beyond the natural variation that can be determined.



Purpose: This monitoring item was established to help ensure that the maximum regeneration harvest sizes permitted in the Forest Plan are not exceeded without appropriate documentation. The Plan requires this item be reported every two years. The expected accuracy and reliability of the information is high.

Background: The Plan provides standards and guidelines for timber harvest area sizes for individual MAs. These harvest area limitations are primarily for regeneration harvest methods which are clearcuts, seedtree and shelterwood methods. The purpose is to provide a balance for all the major resources emphasized in each of the specific MAs. In MA 11, for example, regeneration harvest area size is recommended to not exceed 20 acres to provide habitat for moose and white-tailed deer. In MA 12, the regeneration harvest area size is recommended to not exceed 40 acres to provide habitat for elk. In other MAs, no specific guides are given, but regeneration harvest area sizes need to be consistent with other management objectives for the MA.

Exceptions to these guides can be considered during an environmental analyses in which location-specific land attributes and issues are considered and the harvest area size and resultant openings are planned to best meet the management objectives of the area. The Regional Forester needs to approve any non-catastrophic harvest area request to exceed 40 acres. The Forest Supervisor can approve an opening greater than 40 acres when catastrophic events such as fire, windstorms, insect attacks, or disease damages a forest stand. Monitoring of these approved exceptions for timber harvest areas and resultant openings is done to track the amount of variation from the MA guidelines.

Results: Table E-8-1 displays the Forest-wide average harvest area size in acres for each MA by harvest method. The period shown is the last twelve years, from 1988-99, including a 12 year average. The harvest methods displayed are clear cutting, seed tree cutting, shelterwood cutting, and all other harvest methods. *Clearcutting* generally leaves a few scattered live and dead trees per acre for cavity-nester use; *seedtree* harvest leaves about four to eight trees per acre for natural seeding; *shelterwood* harvest leaves about nine to 15 trees per acre for natural seeding and environmental protection such as shading. The other harvest methods include overstory removal, salvage, sanitation, thinning, preparatory cuts, and other intermediate silvicultural treatments that do not significantly open the forest canopy. Because of their more limited impact compared to the regeneration harvest methods, these other harvest methods do not have any acreage restrictions for harvest area size.

Appendix C lists the harvest areas resulting in larger than 40 acre openings approved during FY99 as well as an estimate of how long it will take for the vegetation to regrow to meet the management area objectives. There were 16 resultant openings greater than 40 acres approved by the Forest Supervisor in FY98, and 29 openings in FY99. All were in response to root disease, Douglas-fir bark

beetle, windstorm, or dead lodgepole pine. In most cases, the newly created openings were contiguous with an existing harvest unit. Many of these openings did not provide hiding cover because of the extent of mortality.

Evaluation: Figure E-8-1 shows that the average harvest area size for FY 88 to FY99. The average sizes are well below the objectives of 20 acres for MA 11 and 40 acres for MA 12. Average size for the other suitable MAs are also below 40 acres. As discussed in the FY96 Monitoring Report, there were occasional instances of a single year's average value extending beyond 40 acres. These instances occurred when there were relatively few harvest units in a given year, and the units had been approved as described above.

Recommended Actions: Based on review of the monitoring information, no changes are needed to the Forest Plan. Projects approved to exceed 40 acres were done with the appropriate documentation and analysis and, therefore, are consistent with the Plan. Continue to monitor this item.

Table E-8-1 Average Harvest Area Size in Acres by Harvest Method and MA

Harvest Method and Fiscal Year	MA 11	MA 12	MA 14	MA 15	MA 16	MA 17
Clearcutting						
88	17	33	7	20	4	2
89	20	31	22	30	32	0
90	15	15	0	27	14	4
91	8	21	20	19	72	8
92	10	19	30	30	42	0
93	19	18	18	9	22	21
94	6	19	4	1	21	1
95	6	22	10	8	23	0
96	21	15	32	17	0	18
97	11	23	0	14	7	21
98	0	19	0	77	0	0
99	0	24	3	36	0	0
12-yr average	11	22	12	24	20	6
Seed Tree						
88	15	39	12	37	15	13
89	8	30	16	30	34	0
90	33	20	24	35	16	20
91	23	22	17	32	20	18
92	14	18	32	31	1	0
93	4	10	3	22	0	23
94	8	26	4	22	19	1
95	6	18	12	26	13	0
96	0	32	15	74	70	0
97	0	27	0	33	18	11
98	0	41	0	182	0	0
99	20	32	0	37	29	0
12-yr average	11	26	11	47	20	7

Table E-8-1 (con't) **Ave. Harvest Area Size in Acres by Harvest Method and Management Area**

Harvest Method and Fiscal Year	MA 11	MA 12	MA 14	MA 15	MA 16	MA 17
Shelterwood						
88	32	10	12	27	0	0
89	15	15	14	25	8	0
90	15	27	0	17	20	0
91	13	25	10	28	29	0
92	24	31	25	0	14	15
93	3	1	31	1	26	0
94	8	15	0	35	1	0
95	7	20	0	0	28	0
96	12	15	0	0	48	28
97	0	7	0	7	0	0
98	52	48	0	8	0	0
99	272	27	0	30	0	0
12-yr average	38	20	8	15	15	4
All Other Methods						
88	32	32	58	31	18	28
89	31	98	54	40	113	28
90	29	22	35	27	26	8
91	43	36	45	40	38	58
92	28	48	20	38	35	45
93	20	30	23	22	23	35
94	43	22	19	20	9	9
95	26	34	17	22	21	3
96	26	24	36	31	0	0
97	15	17	18	20	23	11
98	41	18	0	25	34	0
99	32	91	0	65	10	15
12-yr average	31	39	27	32	29	20

TIMBER: Clear Cut Acres Sold; Monitoring Item E-9

ACTION OR EFFECT TO BE MEASURED: Acres of clear cut harvest sold.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Not defined.



Purpose: This monitoring item was established to help ensure that the amount of future clear cut harvesting on the Forest is steadily reduced. The Forest Plan requires that this item be reported annually. The expected accuracy and reliability of the information are both high.

Background: Congress has directed the Forest Service to reduce the amount of clear cut harvesting by 25 percent by 1995. The base line year for this comparison is FY 88. In addition, in a memo dated June 4, 1992, the Chief of the Forest Service expressed his expectation that, when considered throughout the National Forest System, clear cutting would decline by as much as 70 percent from FY 88 to FY98. The Kootenai is implementing the Chief's guideline policy and using alternative harvest techniques when appropriate.

Results: Table E-9-1 displays the results since FY 88. As can be seen, the acres sold for clearcut harvest declined from FY90 to FY99, with the exception of FY96. In FY96, the amount of clear cutting increased, primarily due to emphasis on salvaging fire-killed timber created by the 1994 fires and dead lodgepole pine killed by the mountain pine beetle epidemic. In many instances, the salvage of fire-killed timber or dead lodgepole pine resembled a clear cut. After FY96, the amount of clearcutting declined again, and for FY99 there has been a 95 percent decrease.

Evaluation: When it was possible to do so, the Forest reduced the amount of clear cutting. As a result, the Chief's goal for reducing clearcutting has been fully met.

Table E-9-1 Clear Cut Acres Sold by Fiscal Year

	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99
Clear Cut Acres Sold	5,734	5,795	3,068	4,159	3,557	1,469	1,262	483	3,774	902	201	265
Percent Reduction from 1988	N/A	None	46%	27%	38%	74%	78%	92%	34%	84%	96%	95%

Recommended Actions: Continue monitoring.

RIPARIAN: Riparian Areas; Monitoring Item C-9

ACTION OR EFFECT TO BE MEASURED: Ensure that the intent of riparian management goals are met.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Failure to meet state and Inland Native Fish Strategy (INFS) standards.



Purpose: This monitoring item was established to help ensure that the intent of riparian management goals is met. With the 1995 INFS amendment, the Forest Plan requires that this item be reported annually. The expected accuracy and reliability of the information are both high.

Background: Riparian zone management is one of the most important practices to maintain water quality and a large number of riparian-dependent resources. Riparian management involves implementing actions that maintain or improve riparian conditions, and identification and mapping so resource managers know the area of concern and application. Thus, one of the Plan objectives is to site-specifically identify and map all riparian areas before any projects such as timber sales are authorized (Forest Plan, page II-11).

Since the Plan was approved, Forest guidelines have been completed for the identification, mapping, and management standards necessary to protect riparian areas. Forest Plan Appendix 26, Riparian Area Guidelines, was issued in 1991 and was further updated in 1994 with the passage of the Montana Streamside Management Zone (SMZ) Law (HB731). These Guidelines stratify the Forest into four different stream classes. These stream classes are:

- Class I: large perennial streams
- Class II: smaller perennial streams
- Class III: intermittent streams
- Class IV: dry draws, swales

Classes I, II, and III require specific resource considerations before any activities can proceed. Some restrictions also apply to Class IV streams, wetlands, ponds, and bogs. Implementation of the Soil and Water Conservation Practices Handbook after 1988, and statewide implementation of voluntary Forestry Best Management Practices in 1989, have also aided the improvement of riparian conditions.¹

In 1995, the Decision Notice for the Inland Native Fish Strategy (INFS) EA amended the Forest Plan by providing an interim strategy to protect native fisheries until a decision is issued for the Upper Columbia River Basin Environmental Impact Statement. The need to modify the existing Plan was determined, in part, from the monitoring of 28 National Forests, which indicated that many watersheds were below Forest Plan standards or exceeded thresholds of concern. INFS modified Forest Plan direction by adding additional requirements to manage fish habitat and channel conditions as well as the standard riparian vegetation zone.

¹Please refer to Monitoring Item F-1, Soil and Water Conservation Practices, for a fuller explanation of how Best Management Practices are monitored.

INFS identified riparian management objectives (RMOs) and riparian habitat conservation areas (RHCA) for streams depending on the size of stream and whether it contained a fishery. INFS only modified those portions of the Kootenai Forest Plan that were less restrictive than INFS.

INFS identified four stream categories, based on length of flow-period and fishery presence or absence:

- Category 1: perennial fish-bearing streams
- Category 2: perennial flowing, non-fish-bearing streams
- Category 3: ponds, lakes, reservoirs, and wetlands
- Category 4: seasonally flowing or intermittent streams

The transition from the original Forest Plan direction to INFS implementation has been a gradual increase in the restrictions placed on riparian zone activities. For instance, the 1991 Riparian Area Guidelines established, by stream class, minimum width of SMZs, number of trees that had to be left after harvest, which classes had restrictions on both-side harvest, maximum unit length, and amount of total harvest per decade per mile of channel length. The 1994 update of the Riparian Area Guidelines incorporated the Montana State SMZ Law, widening the minimum-width of the SMZ. It also mandated percent rather than number of leave-trees, and required protection of all classes of channels.

With the implementation of INFS in 1995, overall riparian area activities allowed became more restricted. For instance, the width of riparian zones (called Riparian Habitat conservation Areas [RHCA] in INFS) increased. Additional standards and guidelines are applied, including requirements for extensive analysis before harvesting in some classes of watersheds. As a result, there was a dramatic reduction in riparian zone activities.

INFS also requires monitoring of the interim direction. The primary focus of this monitoring is to verify that the standards and guidelines were applied during project implementation. Monitoring is also to assess whether the standards are effective to attain Riparian Goals and Management Objectives (RMOs).

Results: With the modification of the Forest Plan by INFS, five approaches are used to track this item:

- 1) Riparian Mapping;
- 2) RHCA/RMO modification documentation;
- 3) RHCA activity tracking;
- 4) Watershed and stream restoration activities;
- 5) Riparian area BMP results.

1) Riparian Mapping: Miles of stream classes and/or stream categories identified and mapped. Table C-9-1 displays the miles of riparian habitat that have been classified and mapped since 1988. Over 5800 lineal miles of riparian habitat have been categorized and mapped since 1988. Over 3300 of these miles are on perennial streams (Stream Classes 1 and 2, INFS Categories 1 and 2). The rest are intermittent and ephemeral streams (Stream Classes III, INFS Category 4).

Table C-9-1 Miles of Stream Classes Identified and Mapped

Fiscal Year	Stream Class 1 & 2; INFS Category 1 & 2; (perennial streams)	Stream Class III; INFS Category 4, (intermittent and ephemeral streams)	Total Miles
1988-89	136	79	215
1990	409	246	655
1991	392	244	636
1992	363	299	662
1993	205	204	409
1994	157	87	244
1995	235	307	542
1996	451	281	732
1997	201	102	303
1998	207	171	378
1999	567	501	1,067
Totals	3,329	2,525	5,843

2) RHCA/RMO modification documentation: This is tracked to determine whether INFS standards and guidelines were applied during projects. In FY99, default RHCA widths were applied on all but three projects. These three were modified based on sight-specific analyses that determined that the RHCA function could still be met with a slightly narrower RHCA width. Default RHCA widths were applied on almost 32 miles of stream, reduced widths on 0.4 miles.

Default RMOs were used on all but two projects. On these, the width to depth ratio (W/D) RMO was modified based on site specific analyses. Specifically, a W/D ration more representative of that stream-type was developed. As was the case with RHCA width modification, the RMO modification will not either degrade, or delay attainment of management objectives for fish habitat or channel and aquatic conditions.

3) RHCA activity tracking: In 1999, a little over 95 miles of RHCA had some level of activity. Most of the work was for road re-construction, improvement of road crossings, road drainage improvement, and trail maintenance and improvement along streams.

4) Watershed and stream restoration activities: In 1999, riparian-related watershed restoration activities were accomplished on over 70 miles of stream. Over 56 stream crossings were removed or improved, and over 120 sites had improvements such as ditch relief culverts, stream channel veins (near bridges), or large woody debris (LWD) addition to reaches where woody debris was lacking. Since 1990, watershed restoration on the Forest has totaled over 6,700 acres.

5) Riparian area BMP results: This includes evaluation of implementation and effectiveness of applicable riparian BMPs that were used during management activities in or near the riparian zone. Table C-9-2 displays the results of the riparian-area BMP evaluation process from years 1990 through 1999. In even numbered years, results include information from State Audits. In odd numbered years, results are only from the on-forest BMP tracking program. The determination of proper BMP application is referred to as implementation monitoring. The determination of whether the BMP worked or not is effectiveness monitoring.

In FY99, seventy-four specific practices were evaluated within riparian areas. Acceptable implementation was accomplished 100 percent of the time. Fifteen effectiveness evaluations were completed for this same period, of which 87 percent of the BMPs were deemed to be effective. For eleven projects, a riparian-area specific BMP evaluation was made. On all of these projects, BMP requirements related to riparian area protection were met.

The Forest also conducted three Supervisors Office-Level BMP Reviews. These Review included evaluation of riparian and SMZ standards for both INFS and the KNF Forest Plan Riparian Area Guidelines. For two of these Reviews, results documented that all practices in the SMZ and riparian zone met the requirements. On one of the Reviews, it was found that INFS requirements had been met but one of the KNF Riparian Area Guidelines had not. Specifically, a steep swale had been used by a forwarder during the logging portion of the project. While it is likely that the swale will carry increased flows in the future from the compaction and water re-routing effects, no aquatic impacts are expected or anticipated due to the distance from the unit to the stream.

Riparian-condition reviews were also made for 5 Allotments on the Forest in FY99. Besides being used to document protection and improvement of the riparian areas, this information was used to determine putout dates for the grazing season.

Table C-9-2 **Riparian Area BMP Implementation and Effectiveness**

Fiscal Year	Data Source	Implementation Evaluations	Percent Acceptable or Better	Effectiveness Evaluations	Percent Acceptable or Better
1990	Forest & State (EQC) MBMP Audits	201	89%	82	87%
1991	Forest-wide BMP Audits	145	95%	145	95%
1992	Forest & State (EQC) MBMP Audits	241	88%	241	96%
1993	Forest-wide BMP Audits	226	96%	120	92%
1994	Forest & State (EQC) MBMP Audits	295	91%	117	99%
1995	Forest-wide BMP Audits	503	83%	467	82%
1996	Forest & State (EQC) MBMP Audits	428	96%	169	98%
1997	Forest-wide BMP Audits	254	97%	226	95%
1998	Forest & State (EQC) MBMP Audits	43	91%	117	99%
1999	Forest-wide BMP Audits	74	100%	15	87%
Totals		2,410	93%	1,699	93%

For the 2,410 practices evaluated over the ten-year period, acceptable implementation was accomplished 93 percent of the time. Almost seventeen hundred effectiveness evaluations were completed for this same period, of which 93 percent were deemed to be effective.

Conclusion: Riparian zones are being identified and mapped as part of Forest Plan implementation. Forest Plan Appendix 26, Riparian Area Guidelines, and INFS direction are being followed. After increased emphasis over the last five years, riparian areas discovered during layout and sale administration are being identified and protected. Review of this portion of the monitoring item indicates we are successfully applying riparian considerations to projects. We are effectively applying the Riparian Area Guidelines, INFS direction, and riparian BMPs on projects; therefore, we are on-track with the Forest Plan. Because of the new direction from INFS, no change to Plan direction is needed at this time.

Recommended Actions:

Continue emphasis on BMP implementation and evaluate effectiveness.

Continue to monitor a sample of projects where RHCA's have been site-specifically modified or harvest allowed within the RHCA to see how the activities were implemented and what, if any, long-term effect these activities had on the riparian condition.

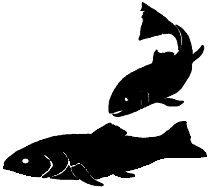
Continue to monitor a sample of projects to evaluate whether the Riparian Area Guidelines/INFS are meeting their objectives or whether there is a need to change direction.

Assemble existing data, and begin to collect additional data, to develop more appropriate localized-RMOs for this Forest.

WILDLIFE & FISHERIES: Fisheries Habitat; Monitoring Item C-10

ACTION OR EFFECT TO BE MEASURED: Determine changes in fish habitat and populations

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: +/- 10% change in redds
+/- 2 degrees change in stream temperature
+/- 10% change in sediment
+/- 10% change in embeddedness
+/- 20% change in debris accumulations



Purpose: This monitoring item was established to help ensure that changes in fish habitat and populations do not exceed certain levels. The Forest Plan requires that this item be reported every two years. The Plan expected accuracy and reliability of the information is moderate to high.

Background: Fish habitat and population concerns overlap with the Kootenai's responsibility for protecting downstream beneficial uses as required by State of Montana and Federal laws and regulations. The Forest Plan committed to water quality protection measures and special streamside management provisions in riparian areas as the means for protecting fish habitat (see Forest Plan - Chapter II, and Appendices 25 and 26). The Plan also scheduled fish habitat improvement projects as mitigation for negative cumulative effects on the fisheries resource as a result of Plan implementation and management activities that pre-dated the Plan.

The Plan indicated that stream surveys, streambed coring, water temperature, woody debris counts, redd counts, and/or embeddedness sampling could be used as data sources to assess the effects of implementation on fish and habitat. Monitoring Item F-2 identifies seven representative watersheds where this data should be collected as a measure of Forest-wide management effectiveness. However, because most of the implementation activities have occurred outside of the seven representative watersheds, the Forest has dedicated more time to site-specific project monitoring for timber sales than to monitoring of the seven representative watersheds.

Forest Plan direction for protection of fisheries was amended in 1995 with the Inland Native Fish Strategy (INFS). INFS amended the Plan by providing additional riparian management objectives, standards and guidelines, and monitoring requirements. The revised monitoring requirement from INFS directs that we evaluate whether implementation of standards is moving towards attainment of riparian goals and objectives - however, we should not expect conclusive monitoring results in the near-term because streams respond to new riparian management practices slowly.

In 1992 we determined that this monitoring item would not allow a meaningful evaluation of the effect to fisheries habitat from Forest Plan implementation actions such as timber harvest and road construction. In 1993 we began investigating alternative ways to monitor fish and fish habitat.

Results: Data from stream surveys, streambed coring, water temperature, woody debris counts, redd counts, and/or embeddedness sampling have been collected across the Forest. This data has been collected in one or more of the seven representative watersheds and many more watersheds not

specifically identified in the Plan. The FY99 monitoring results are consistent with the summary conclusions stated in the FY96 - 98 Monitoring Reports.

Redd Counts - *This task requires a field survey of streams during and immediately after fish have spawned to estimate the amount of fish reproduction that has occurred. The intent is to test whether Forest management direction and implementation activities are having adverse or beneficial effects on fish abundance.*

Data on redd counts have been collected in three of the seven representative watersheds. Also, in cooperation with Montana Department of Fish, Wildlife and Parks, one representative watershed and six other streams were checked for fall spawning redds. Numbers of redds were up from FY98 in all streams except O'Brien (37 versus 47 in FY98) and Quartz (102 versus 105 in FY98) Creeks. This monitoring suggest that bull trout population numbers have increased in the last few years and are static. The number of spawning adults continues to fluctuate for several reasons. Bull trout spawning data from Canada continues to suggest that the Upper Kootenai stock of bull trout is functioning appropriately. The majority of these fish winter in Lake Koocanusa and spawn in Canada.

The fall redd count data for all watersheds indicate year to year variability in fish spawning that exceeds the limits set in the Forest Plan. This variability appears to be largely the result of inconsistent monitoring methods. The number of streams monitored for redds and the length of each stream monitored has changed each year as we seek to identify the preferred spawning areas. As we reported in 1998 and as has been documented in the scientific literature, the relationship between fish spawning and present forest management is obscure. The use of redd count data is impractical as a measure of protection effectiveness. Redd counts will be used as a data source for tracking the trend in bull trout numbers, but not as a measure which would initiate further action.

Stream Temperatures - *This task involves the deployment of a recording device that can measure water temperatures on a continuous basis. The intent is to test whether Forest management and implementation activities (mainly riparian activities) are having adverse or beneficial effects on water quality.*

Stream temperature data has been collected on all seven representative watersheds. The monitoring data shows a strong relationship between stream temperature and the concurrent air temperature and rainfall (or snowfall) for the watershed. This variability in stream temperatures is unrelated to Forest management. However, data from several monitoring sites suggest that the effects of historic riparian logging practices that pre-date the Forest Plan (primarily two-sided riparian area harvest) may affect stream temperatures. The INFS amendment and the Riparian Area guidelines identified stream side management zones or riparian habitat conservation areas which require a certain amount of trees to remain adjacent to the stream. This has minimized the effect that timber harvest has on stream temperatures.

Previous monitoring identified a need for temperature data from reference streams to better portray "natural conditions" as well as increase the power of the existing data. In FY99 the Forest will place a minimum of ten temperature monitors within selected reference watersheds. Additionally the Forest will be identifying what temperature monitoring data has been collected on Forest by other agencies.

Sediment Cores - *This task has required the annual removal of a fraction of the streambed to identify changes in fine sediment conditions - that is, monitoring of sediments smaller than 1/4 inch in size by taking streambed cores. This task, together with the embeddedness task (below) and Monitoring Items F-2 and F-3, look at the effects of forest management on water and fish habitat quality. The intent is to test whether Forest management direction and implementation activities (mainly road and harvest activities) are having adverse or beneficial effects on streambed quality.*

Sediment core data has been collected on four of the seven representative watersheds, plus many additional watersheds. Some of this monitoring is a result of a cooperative effort to evaluate proposed hardrock mines and the status of bull trout on the Forest. The monitoring data shows a strong relationship between stream bed sediment and the annual total water yield and highflow conditions for the watershed. Monitoring at several sites suggests that there has been a 5 to 10 percent increase in fine sediment compared to undisturbed reference sites as a result of cumulative forest management. However, these findings do not answer whether present Forest Plan standards are adequate to prevent the observed change in stream bed sediments. This streambed data has been useful for documenting baseline watershed conditions for bull trout as part of the ongoing Section 7 consultation.

Embeddedness - *This task involves monitoring of the streambed surface to look for an increase or decrease in the amount of fine sediment accumulating on streambed surfaces. The results from this task, together with the streambed coring and Monitoring Items F-2 and F-3, are evaluated as a group to look for consistent trends. The intent is to test whether Forest management direction and implementation activities (mainly road and harvest activities) are having adverse or beneficial effects on streambed quality.*

Embeddedness data has been collected on four of the seven representative watersheds, plus some streams inventoried in FY99. This data was also used for documenting baseline conditions during Section 7 consultation on bull trout. The embeddedness monitoring data for all watersheds indicates year to year variability that is greater than the limits set in the Forest Plan. The monitoring data suggests a relationship between stream surface sediment, and the annual total water yield and highflow conditions for the watershed. This complicating factor in the embeddedness data does not answer whether present Forest standards are adequate or not to prevent an increase in streambed surface sediments.

Woody Debris - *This task involves monitoring of stream segments to look for an increase or decrease in the type or amount of logs lying in or above the stream. Woody debris (logs) plays a critical role in maintaining stream habitat quality and maintenance of stable stream channels. The intent is to test whether Forest management direction and implementation activities (mainly riparian and upland harvest activities) are having adverse or beneficial effects on the instream wood accumulations.*

Woody debris data has been collected on four of the seven representative watersheds, with several hundred additional sites elsewhere. The woody debris monitoring data for all watersheds indicate little year to year variability in those instances where a consistent survey method was used. The

FY99 and previous year's data indicate a substantial reduction in instream woody debris in most managed streams by comparison to reference streams. However, most of these monitoring results cannot distinguish between historic impacts and the effect of present management direction. Other circumstantial information suggests that in nearly all instances where woody debris is absent (or nearly so), deliberate stream cleaning completed before the Forest Plan was written is the likely cause. The INFS amendment and the Riparian Area Guidelines provide direction on providing future woody debris recruitment to streams. The Forest will be compiling the large woody debris data that has been collected during past years' surveys for inclusion in a Forest aquatic data base. The Forest will also be collecting large woody debris data from reference streams to better define the "natural" frequency for woody debris.

Other Applicable Information: Stream survey data and monitoring over the last twelve years hints that the recent INFS amendment to the Forest Plan riparian management objectives (RMOs) may not fit our local site conditions. The INFS RMOs provide objectives for different habitat features. They are numerically specific over a very large area. Our data from watersheds that have not been significantly affected by land management suggests that: local instream woody debris should be higher than INFS requirements; local abundance of stream pools should be higher than INFS requirements; and, local pool dimensions (widths and depths) should be somewhat higher than INFS requirements. We say "should be" for a reason - our sampling is not extensive enough to objectively modify the INFS RMOs for the local area at this time; however, the additional temperature and woody debris data to be collected in FY99 will help determine how well those two RMOs fit the Kootenai's "natural condition."

The Interior Redband trout research project initiated in 1997 in cooperation with the University of Idaho, Bonneville Power Administration and Montana Department of Fish, Wildlife and Parks has been completed and the Master's Thesis from that project is available from the University of Idaho. As a result of that project, there is currently a group looking at restoration and enhancement opportunities specifically targeting redbands. The Forest will actively participate in that effort.

The Libby Ranger District continues to monitor the effects of the Quartz Creek Watershed Restoration. Lessons learned from that effort have been implemented across the Forest to improve watershed restoration projects and increase their effectiveness in protecting and restoring aquatic habitat.

Evaluation: At this point in time we cannot determine whether implementation of existing Forest Plan prescribed practices results in stream conditions that are outside the variability limits set in the Plan. As noted in the above discussion, it is difficult to distinguish among a variety of possible causes for change in streams. Our ability to detect changes in streams and habitat and identify the cause using the C-10 monitoring data is low, and the risk of a faulty conclusion continues to be high. Also, many of the monitoring variables are much more variable than assumed, and thus the accuracy and reliability of C-10 data may be moderate at best. The present Forest Plan monitoring effort and sample design can reliably identify only a 50 percent or greater impact from all causes of change. Thus, the data is not sufficient to reliably detect a change as small as the present variability limits for monitoring element C-10. In effect, some C-10 monitoring items appear to be outside the acceptable limits of change more often than not, but the cause could be natural, human-caused, a combination of the two, or could be a result of sample error. As noted above, some monitoring procedures are not

reliable indicators, and others have been significantly affected by the INFS amendment to the Forest Plan. The 1999 monitoring results reinforce the conclusions that were previously disclosed in the 1996 - 1998 reports, and indicate the need to change the monitoring requirements.

Recommended Actions:

Monitoring: As indicated in the FY96 Monitoring Report, a Forest interdisciplinary team was convened in 1997. This group of water, fish and watershed experts recommended a complete update of the Forest Plan C-10 monitoring requirements because of the substantive changes in management direction (INFS) and the 10 year monitoring evaluation. Since then, there has been a National effort to develop a database to house this type of information. This effort is the National Resource Information System (NRIS). The Forest is currently developing a database that will facilitate moving all new and existing data into NRIS when it is made available within the Region. There are now also monitoring items mandated by the programmatic biological opinion for steelhead and bull trout that will affect the items we monitor and the methods by which they are reported.

Forest Plan Implementation: We have modified the C-9 monitoring requirement to better track implementation of Best Management Practices and INFS standards and guides as recommended by the C-10 interdisciplinary team. We have also issued a Kootenai National Forest policy statement on how to site-specifically designate INFS riparian buffer strips to ensure Forest-wide consistency in this critical habitat protection strategy. We have also completed a Best Management Practices training program for all field personnel to improve our performance in watershed and habitat protection.

Habitat restoration efforts continue to focus on mitigation of sediment and woody debris impacts. These efforts are focusing on known sediment sources and areas lacking woody debris. The Forest is committed to restoration efforts where project analyses indicate a need.

SOIL & WATER: Soil and Water Conservation Practices; Monitoring Item F-1

ACTION OR EFFECT TO BE MEASURED:	Determine if regional and project soil and water protection practices protect soil and water resources and water quality.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Failure to meet State Standards and Protect Beneficial Uses.



Purpose: This monitoring item was established to try to ensure that State water quality standards are met. The Plan requires that this item be reported annually. The expected accuracy and reliability of the information are both high.

Background: The Forest has been monitoring the Soil and Water Conservation Best Management Practices (BMPs) since 1988. These BMPs are required forest wide to meet State water quality standards, and to meet our MOU obligation with the Department of Environmental Quality that makes the FS the management agency for water quality protection on National Forest System lands. The BMPs are various practices which are designed to eliminate or reduce non-point sources of pollution such as sediment, which is the primary source of non-point pollution on the Forest. Other BMPs seek to protect and conserve the soil resource. BMP monitoring consists of two parts: 1) determine whether the practice (BMP) was applied on-the-ground as called for; and 2) if applied correctly, did it eliminate or minimize the effect that required the BMP. The determination of proper BMP application is referred to as implementation monitoring. The determination of whether the BMP worked or not is called effectiveness monitoring.

Projects that are evaluated for BMP implementation and effectiveness have included timber harvest, road construction and reconstruction projects, mine site rehabilitation, and other activities that expose or disturb soil, creating ground conditions that could lead to water quality impacts; or that adversely affect the soil resource

In 1998, the Forest implemented a new BMP program to better protect soil and water resources. One of the elements under this new program, Supervisors Office-level BMP Reviews, were performed on three districts in FY99: Fortine, Libby and Three Rivers Districts. Another element continued under the new program is the spot review of selected activities. Spot monitoring of selected activities is conducted to determine BMP effectiveness as well as determining compliance with our requirement to protect beneficial uses of water, including fisheries and aquatic habitat.

RESULTS:

FY99 BMP monitoring on the Forest involved three different efforts: 1) BMP monitoring done by Kootenai Forest personnel during their normal work activities; 2) BMP Reviews conducted on selected activities by Districts and Engineering Zones; and 3) Supervisors Office-level BMP Reviews on three Districts. The implementation and effectiveness monitoring evaluations were both rated as shown in Table F-1-1.

Table F-1-1 **BMP Evaluation Rating Scale and Summary**

Rating	Implementation	Effectiveness
Acceptable or Better	Operation Meets Requirements	Adequate or Improved Protection of Soil and Water Resources
Unacceptable	Minor Departure from Intent	Minor and Temporary Impact
Very Unacceptable	Major Departure from Intent	Major and Temporary, or Minor and Prolonged Impact
Grossly Unacceptable	Gross Neglect or No Application At All	Major and Prolonged Impact

1) Results of BMP Monitoring Done by Kootenai Forest Personnel, including District and Zone Review Teams (1) and 2) on previous page): About 27 separate projects were audited in FY99 by KNF personnel. Implementation evaluations were completed for 149 BMPs and implementation evaluations met the requirement of acceptable over 98 percent of the time. Effectiveness evaluations in FY99 met the requirement of acceptable almost 95 percent of the time (see Table F-1-2).

Table F-1-2 **BMP Monitoring Results by Kootenai Forest Personnel**

	Implementation (%)										Effectiveness (%)									
	90	91	92	93	94	95	96	97	98	99	90	91	92	93	94	95	96	97	98	99
Acceptable or Better	96	96	93	98	99	92	98	98	97	98+	91	88	86	96	99	92	100	99	96.3	94.8
Unacceptable	4	3	6	2	1	8	2	1.9	2.8	1.6	8	12	13	3	1	8	0	1.2	3.4	4.5
Very Unacceptable	0.4	1	0	0.2	0.02	0	0.02	0.1	0	*0	1	0	2	1	0	0	0	.14	0.2	.07
Grossly Unacceptable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*- 1 out of 1897 practices

Comments: Only two of the 149 practices evaluated for implementation and effectiveness consistently showed up as problems:

SWCP 15.2- Location and Design for Roads and Trails; and
 SWCP 15.7- Control of Permanent Road Drainage.

In both cases the problem was older roads that had been located, designed and constructed without current BMPs in mind.

Solutions to this problem will come from two directions: 1) New road construction and reconstruction includes provisions to build these BMPs into the process, to properly locate and create acceptable surface drainage; and 2) existing roads will be brought up to BMP standard for the surface drainage concern (see text within the Three Rivers District Project Review below). Point 2) is also carried into the Action Items list for 2000.

2) Results of Supervisors Office-level BMP Reviews:

Objectives of the Reviews: The objectives of the FY 1999 Supervisors Office Staff-Level BMP Reviews were as follows:

- Involve Supervisors Office personnel in the KNF BMP Process, to make sure the BMP "feedback loop" is completed from the bottom to the top, from the District seasonal to the Forest Supervisor;
- Involve outside entities such as the DEQ and Montana State BMP Audit Team personnel to build credibility and to give them the opportunity to pass on concerns and advice;
- Provide feedback to a District and/or Zone on their BMP work for a particular project;
- Where problems and areas of concern are found, discuss solutions and future avoidance direction with all of the applicable resources.

Additional objectives addressed in the 1999 Reviews included:

- Providing Districts and Engineering Zones with an opportunity to ask questions about any BMP-related work, and;
- To highlight creative solutions to problems; and to provide training and familiarization about the KNF BMP Program for all SO-Staff Officers and the new Forest Supervisor.

Fortine District Project Review: This Review focused on a unit and two roads associated with the Lost Lamb Salvage Sale. The sale contract was signed in December of 1996 but harvest and slash treatments were done in fall and late fall of 1998, respectively. There was no road construction on this sale but both existing and re-constructed roads used in the sale were included as part of the Review.

Over 94% (33/35) of the practices evaluated within the unit and on the roads received a score of acceptable or better ("4" or "5") for both implementation and effectiveness (Appendix 1). For implementation, two practices received a score of "2". For effectiveness, one practice was awarded a score of "2" and one got a "3". The Riparian Areas portion of the form revealed that there were no problems with either the KNF Riparian Area Guidelines, or the Inland Native Fish Strategy (INFS) requirements. One question did come up under this section, however: "What is the definition of *fish-bearing* under INFS?" which is covered below and addressed under the Key Findings and Discussion Points.

Key Findings from the Fortine Review:

- The idea of developing and maintaining an up to date list of road-related improvements for possible future use was commended by the Forest Supervisor and will be mentioned again in Summary of this Report.

- A key finding from this Review was the close coordination that has been developing between the District and the Zone Offices over watershed improvement work, and particularly the "10% fund" list. It was obvious they were working together to address the highest priority needs with this and other funding sources. There were a few signs that there had been a slight disconnect recently, but overall, the level of cooperation and communication was excellent and the District and Zone were both commended by the Team.

- Responding to the question: "What is the definition of fish-bearing for purposes of meeting INFS?" Per John Carlson response: "Streams are to be considered fish bearing if they are a migratory route and at least up to the point where they no longer can support fish (example: above a barrier, too steep, etc). In short, if fish occupies a segment during any portion of the year, it is INFS Category 1, fish bearing".

Libby District Project Review:

The second of the FY99 SO Staff Level Reviews took place on the Libby District Unit on September 28, focusing on a unit and the roads associated with the Bristow Creek Salvage Sale. The sale contract was signed in December of 1996, harvest was done in the spring and fall of 1999, the slash to be treated in the late fall on 1999. The Review was able to look at both road construction and reconstruction.

Over 93% (31/33) of the practices evaluated within the unit and on the roads received a score of acceptable or better for implementation; and 30 out of 33 practices (91%) received a score of acceptable or better for effectiveness (Appendix 1). For implementation, two practices received a score of "3"; and for effectiveness, three practices were awarded scores of "3". The Riparian Areas portion of the form indicated that there were no problems with either the KNF Riparian Area Guidelines, or the Inland Native Fish Strategy (INFS) requirements.

Key Findings From the Libby Review:

- A major take-home message from this Review was the costs and applicability of the two road-surface water drainage treatments, dips and flappers. Rolling dips have their place but are limited by the grade they can be safely installed on, and there is a safety issue for winter haul, especially on steeper road grades. Dips are cheaper and should be self-maintaining if properly installed. Flappers require more maintenance over time and eventually wear out. Dips are very effective but can be removed by in-experienced grader and snowplow operators.

- In most instances, a culvert should be used to carry significant ditch flow across/under a road. If we know we are going to have flow for an extended period, it is more appropriate to use a relief culvert. Where a road will be closed for an extended period of time (years), a dip that accesses the ditch may be appropriate but the concern for, and the consequences of, erosion of the dip will have to be considered.

Three Rivers District Project Review

The final FY99 SO Staff Level Review took place on the Three Rivers District on October 7. It focused on the Blistered Beetle Salvage Sale (Photo X) and USFS Roads 5874 and 5877. The sale was sold in late 1997, harvested in the fall of 1998. The slash has not been treated yet so all of the slash treatment BMPs were rated as "not applicable". Both roads had reconstruction done as part of the sale. Note: Some questions and issues came up during this Review that were not necessarily related to this unit or roads, but they were related to the BMP Program. They are included in the Key Findings and Discussion Section for this Review.

Twenty-six of the 32 practices evaluated within the unit and on the roads (81%) received a score of acceptable or better for implementation; and 27 out of the 32 practices (84%) received a score of acceptable or better for effectiveness (Appendix 1). For implementation, two practices received a score of "2", and four received a score of "3". For effectiveness, three practices were awarded scores

of “2” and three got “3’s”. The Riparian Areas portion of the form indicated that there were no problems with the Inland Native Fish Strategy (INFS) requirements. There was a violation of the KNF Riparian Area Guidelines.

Key Findings From the Three Rivers Review:

- Item 1 was written post-review by Tom Maffei, KNF Timber Sale Officer, who was on the Review as the Acting Operations Staff Officer: Unit 14C was originally designed as a larger unit with a combination of skyline and tractor logging systems. During layout, most of the portion originally envisioned as skyline was deleted. There was no one on the review who had the knowledge why, although it was surmised that the road above the unit could not be used due to Open Road Density restrictions. Regardless of the reason, the remainder of the unit was included in the contract with tractor logging specified. The Purchaser chose to log the unit with Cut to Length equipment and a log forwarder. Normally, one would expect less ground impacts from this type of a system. The Sale Administrator (SA) followed the skidding pattern designed in the Implementation Notes. Unfortunately, this showed the east side of the unit coming down the swale. The SA has the authority to layout the skid pattern to best fit the ground and Forest Plan Guidelines, and the swale should not have been used for skidding. The problem was compounded by the use of a forwarder on the steep topography. Due to the size and stability of these machines, they cannot work side - hill, therefore the forwarding activities were conducted up and down slope. Restricting the forwarder to suitable topography would have precluded problems identified by the Team. The steeper slopes in the eastern portion of the unit might have been better logged with the use of rubbed tired skidders and excavated trails. This would have allowed the swale to be crossed at a right angle and the main skid trail not following the swale. The original design utilizing the upper road and skyline logging may have been a better option. The Team also thought that a sale layout person should have been part of the Review for discussions like this.

On the subject of the lack of suitable erosion control on the forwarder trails, the SA stated that the trails in the eastern portion of the unit had looked acceptable at the time the Purchaser completed work in the unit. The steep and, in places, broken terrain led to much of the slash mat that a forwarder usually operates on being pulled or washed downhill, leaving exposed soil on the forwarder trails.

- During the reconstructed road review portion of the Review, a discussion was held on the process of identifying road-related improvements. There was some debate about who should do this work, and particularly who, watershed or engineering, should be identifying it on the ground (road). After some discussion, the group agreed that there were often different objectives for each group: Watershed emphasizes water yield and water re-routing problems while engineering usually emphasizes road surface drainage problems. In situations where the two groups do not communicate, the problem identification process only meets one of the objectives. The solution is to emphasize communication between watershed and engineering so that they can at least talk about the two sets of objectives and can prioritize the work that can be done.

- An offshoot of topic 2 above concerned the problem with accomplishing **all** of the BMP-related work we are identifying as being needed on roads. Part of this discussion brought up a statement that Jim Saurbier of Regional Engineering made at the RTA session: “**All** BMPs must be met **as a minimum** when we construct, use or reconstruct a road”. Another discussion point from this Review also relates to this issue: *”What does it mean when we say ‘Bring up to BMP standards? Does that indeed mean all BMPs or just the highest priority ones?’”*

This is an issue that has surfaced on the Forest before and was addressed in a 9/17/98 memo from then-Forest Supervisor Schrenk. In this memo, Schrenk stated that our emphasis should be on addressing the highest priority work where funding was limited, but that those situations that had the potential to impact water quality should be the highest priority .

I talked to Jim Saurbier who said that he had indeed made the statement. Jim said he did not think his statement was in conflict with the Regional Forester memo of 3/11/99. This memo stated we needed to "...Prioritize the needed work to: 1) correct the defects that are delivering sediment to the waters; 2) correct those that are at risk of delivery; and 3) correct the defects which affect the servability of the road." Jim said that the Lolo NF also believed there was some conflict in the messages and had a meeting with the RF to get it clarified. He gave me a copy of their follow-up memo wherein they stated they were going to do the priority work as a minimum but would work to do all of the BMP needs.

I recommend that we follow the RF and FS memos and work to accomplish the high priority BMP work where funds are limited. We need to make it clear in our NEPA documents that where funding is limited, we either identify which BMPs we are going to address, or state we are going to treat the highest priority ones and list those. It is misleading to state we are going to "bring a road up to BMP standards" when in actuality we can only treat a portion of them.

Two related topics came up during this Review relating to the NEPA analysis done for the sale. The first topic related to a need to make sure that **critical mitigation** identified during such analyses gets into the sale package and gets done on the ground. A concern was raised that this is not getting done and how could it be assured in the future. The related topic was the desirability of having identified needed BMP work before going into NEPA. Concern was that we are not always getting that done, that it is considered non-essential during some analyses.

I really think the answer to these questions is beyond the scope of this Review. However, I would like to emphasize the strong desirability of having such data and that it is difficult to meet the intent of fixing high priority needs without an inventory of such needs. Having such a list will allow us to be ready when and if alternative funding sources emerge.

A process to get **critical mitigation** identified in analyses and either included in the sale package or in other programs (road maintenance, for example) needs to be addressed in each location (district and zone office). The District Ranger and Zone Engineer should see that the data is collected, while the Watershed Representative on the IDT should see that it is included in the analyses. Making sure that BMPs get into the sale contract (Step 5 in the KNF BMP Process) is a logistical step that District Rangers and Zone Engineers need to address.

Key points from the 1999 Supervisors Office Staff-Level BMP Reviews

- Developing and maintaining lists of needed BMP work, using whatever funding source or opportunity you can, was commended. This concept of developing a list of road-related improvements whenever you get the opportunity and then maintaining that for possible future use

was commended by the Forest Supervisor during the D3 Review. Having information identifying this work, before needing it for a NEPA-analysis, gives us other opportunities for funding.

- Coordination between Engineering Zones and Districts is key to identifying and accomplishing critical BMP work. Objectives of the two groups do not always fully agree and to do the best job will require coordination. Agreeing on the highest priority sites for the "10% fund" work is an example of a program that benefits from this close coordination.

- Where funding is limited, address and treat the high priority work first: (1) correct the defects that are delivering sediment to water; (2) correct those that are at risk of delivery; and (3) correct the defects which affect the servability of the road.” (RF memo)

- Critical mitigation, that which has to be accomplished for a sale or project to proceed, needs to be clearly identified in NEPA analyses. It also needs to be included in contracts and in funding requests for other programs. We need to clearly identify which is critical mitigation and which are sale area improvements.

- Flappers versus dips: Flappers and rolling dips are proving to be very effective road surface drainage features and address a critical finding in many road-related BMP reviews. Each have their advantages and each have areas where they are not appropriate.

6. Fish-bearing for INFS compliance- For Forest INFS consistency, streams are to be considered fish bearing if they have fish in them during any portion of the year.

Action Items for 2000: No changes to the Forest Plan are needed at this time. The following actions will occur to improve our implementation and monitoring efforts.

- Continue implementation of the Forest BMP Process and Program. This process emphasizes monitoring, implementation, evaluation, documentation, tracking, and completion of the feedback loop to improve resource protection. Utilize the findings from reports such as this to identify problems and solutions.

- Continue to hold an All-Forest field training session in the spring to cover all aspects of BMPs.

- Implement direction in the Regional Foresters' memo of March 11, 1999, to bring existing roads up to BMP Standards. In this memo, he emphasized correcting road drainage problems, both surface and cross drainage and provided a prioritization scheme for tackling existing problems: 1) correct the defects that are delivering sediment to the waters; 2) correct those that are at risk of delivery; and 3) correct the defects which affect the serviceability of the road.

SOIL & WATER: Stream Sedimentation; Monitoring Item F-2

ACTION OR EFFECT TO BE MEASURED:	Determine sediment impacts on water quality.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	20% increase in bedload or suspended sediments.



Purpose: This monitoring item was established to help ensure that the State water quality standards are met and fish habitat is protected. The Forest Plan requires that this item be reported annually. The Plan expected accuracy and reliability of the information is moderate.

Background: The Plan identified seven streams that would be monitored for this item. They are: Big, Sunday, Bristow, Red Top, Rock, Granite and Flower Creeks. The data to be collected includes bedload and suspended sediment concentrations and streamflow. Nearly all of the Forest's monitoring effort for this item has been dedicated to suspended sediment monitoring for timber harvest and road construction activities. This data is to be used to look for evidence of a change in streambed and water quality conditions, and thus probable effects on beneficial uses, related to present management direction. In addition, a parallel goal has been to gather enough data so that the Forest's sediment predictive tool (R1-WATSED) can be validated and refined for general use before activities are implemented.

The data from this monitoring requirement must be evaluated in the context of results from Monitoring Items C-9, C-10, F-1 and F-3. As with these other monitoring items, the goal of this item is to confirm whether beneficial uses are being protected and water quality laws are being met.

In 1992 we determined that this monitoring item and monitoring item C-10 as designed would not allow a meaningful evaluation of sedimentation from Forest Plan management such as timber harvest and road construction. Based on this we determined that we would accept the intent of this monitoring item but add some additional data sources to help understand the effects of our management. The FY96 Monitoring Report included a nine-year evaluation of the monitoring results for this element. The 1996 nine-year evaluation concluded that a need for change in C-10/F-2 monitoring was apparent, and that a team should be assembled to identify the best course of action. This report, incorporates by reference, the nine-year evaluation of F-2 and updates that evaluation with any new information from 1999.

Results: Information regarding streambeds, suspended solids and streamflow have been collected in several of the seven representative watersheds. This same data has also been collected in many more watersheds not specifically identified in the Plan. The monitoring results suggest the need for change in some areas, but the certainty of these findings are weakened by limitations in the data.

Bedload - *This task requires the placement of a collection device in a stream at the time that streamflows are at the highest point of the year. The intent is to test whether Forest management direction and implementation activities are having adverse or beneficial effects on watershed sediment production or channel stability.*

As outlined in the FY96 Monitoring Report, we have discontinued the collection of bedload sediment samples. In lieu of bedload monitoring, several alternative monitoring methods are now in use as outlined below. The data indicates sediment relations in streams are strongly linked to the annual snowpack and resulting runoff conditions.

Channel Cross Sections - *This task requires detailed measurements of a stream from bank to bank, and then repeating this procedure each year to check for changes in channel shape. The intent is to test whether forest management direction and implementation activities are having adverse or beneficial effects on water yield and sediment production and thus the condition of the stream channel.*

Since 1989, we have collected cross-section data on more than 60 streams, a few of which are reference streams (those with no past activity). In 1999 this monitoring data was collected, but the lack of a computer model to evaluate annual changes in channel shape, and a shortage of reference data, strongly inhibits our ability to draw a conclusion about the effectiveness of management direction.

Riffle Stability Index - *This task requires detailed examination of the roles in stream channels to determine whether conditions are stable or not. The intent is to test whether cumulative management activities are having adverse or beneficial effects on stream channels, watershed conditions and fish habitat via changes in streambed sediments.*

Beginning in 1989, we have applied this procedure on numerous streams on the Forest. In 1999 we again restricted the use of this technique to larger streams where the technique holds promise. The 1999 data indicates the high runoff year had a noticeable effect on streambeds, but the shortage of reference data inhibits interpretation and evaluation of this data.

Particle-size Distribution - *This task requires a detailed description of the rocks in a stream channel. The intent is to test whether forest management direction and implementation are having adverse or beneficial effects on average channel conditions and movement of sediment.*

We have collected particle size distribution data on hundreds of streams since 1992, including more than 100 reference streams. However, these results have not been repeated at specific sites for a long enough time period to identify trends and reach reliable conclusions. In addition, we need more trend data from reference streams so that we can determine the streams' natural variability. The results to date are not powerful enough to draw definitive conclusions. Monitoring of particle-size distribution appears to be warranted given the results to date, therefore we will continue to use this item as a data source.

Suspended Sediments - *This task involves monitoring of the fine sediment particles in flowing water to look for an increase or decrease in the suspended sediment load. The results from this task, together with Monitoring Items C-10 and F-3, are evaluated as a group to look for consistent trends. The intent is to test whether Forest management direction and implementation activities (mainly road and harvest activities) are having adverse or beneficial effects on water quality.*

Suspended sediment data collection has been implemented on all seven representative watersheds. The reliability of the data is limited primarily because of the lack of multiple-year samples and high variability in the data. The suspended sediment monitoring data for all watersheds, and that from 1999, indicates year to year variability that is greater than the limits set in the Forest Plan. The monitoring data suggests a strong relationship between suspended sediment, and the annual total water yield and high-flow conditions for the watershed. This same data confirms that these elevated levels of high-flow suspended sediment only persist for a few years after a human disturbance, but do not return to pre-disturbance conditions and likely represent a long-term chronic problem. However, these results have not been replicated at enough sites or for a long enough time period to reach reliable summary conclusions. The results to date are not powerful enough to draw definitive conclusions on the present Forest management direction.

Other Applicable Information:

Evaluation: The primary intent behind F-2 monitoring is to evaluate whether present management direction is sufficient to maintain water quality. For this monitoring to achieve its purpose, we must be able to distinguish between natural variation and management-induced changes. Our ability to detect changes in streams and habitat and identify the cause using the F-2 monitoring data is largely undefined and the risk of a faulty conclusion is high. Also, some of the monitoring variables are much more variable than assumed, and thus the accuracy and reliability of F-2 data may be moderate at best. The present monitoring effort and sample design generally would only reliably identify a 50 percent or greater impact from all causes of change. The available monitoring data are not sufficient to reliably identify an impact of 20 percent due to present management direction at all monitoring sites. Thus, the discriminatory power of our present monitoring effort is low and the risk of a faulty conclusion is moderate to high.

Forest management direction changed in 1995 per the decision of the Inland Native Fish Strategy (INFS). As stated in the INFS monitoring requirements it will take several years of monitoring to determine whether this new management direction is sufficient to maintain aquatic beneficial uses, or whether additional objectives and protection measures are needed. These findings are consistent with findings in the study of Forest watersheds recently completed by Colorado State University.

Recommended Actions:

Monitoring: As noted in C-10, an interdisciplinary team was formed in 1997 to recommend a course of action to change the C-10 and F-2 monitoring program. The monitoring requirements from F-2 were recommended for revision in the following manner:

- 1) Incorporate sediment monitoring in a new C-11 monitoring element, and refocus the intent as validation monitoring;
- 2) Modify the monitoring evaluation requirements to emphasize trend monitoring as opposed to the present percent-change-from-1987 approach.

Forest Plan Implementation: We will continue to implement INFS. We will continue emphasis on BMP implementation to maintain a strong emphasis on our sediment prevention measures. In addition, we will continue habitat restoration efforts that are focused on restoration of known sediment sources.

SOIL & WATER: Water Yield Increases; Monitoring Item F-3

ACTION OR EFFECT TO BE MEASURED:	Determine the cumulative level of water yield increases and the effects on stream channels.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	20 percent of watersheds exceed hydrologic guidelines.



Purpose: This monitoring item was established to track our progress in protecting water-dependent resources from effects of management-influenced high stream flows. The Forest Plan requires that this item be reported annually. The expected accuracy and reliability of the information are moderate to high.

Background: Water yield increases can adversely affect stream channels and fisheries habitat. The Plan states that projects involving significant vegetation removal will accomplish a cumulative watershed effects analysis to ensure that water yield and sediment levels do not increase beyond acceptable limits (Forest Plan, II-24). The Plan also references the dependence of timber harvest on the rate of hydrologic recovery (Forest Plan, II-4, 7).

Forest Plan Appendix 18 (Kootenai Forest Water Yield Model Instructions and support guidance memos) was provided to guide the process of accomplishing the cumulative effects analysis. This analysis procedure estimates the peak flow increase over natural conditions for a watershed or sub-watershed based on existing and proposed activities on both the public and private lands.

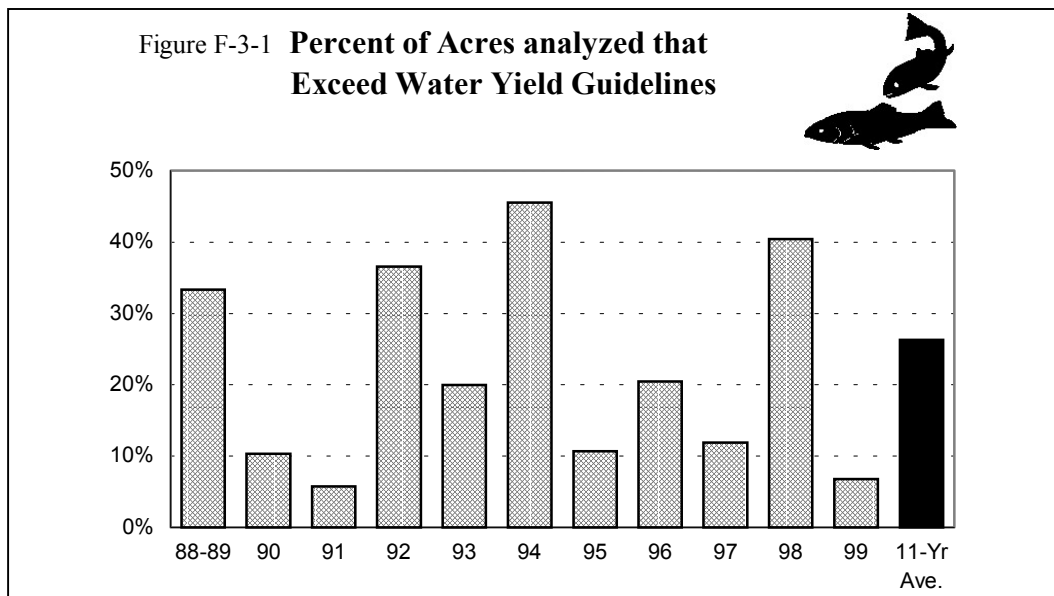
Results: The Forest has employed two methods to examine this data. Table F-3-1 tracks the watersheds which are evaluated as a part of project planning. Since these analyses are not randomly distributed around the Forest, results tend to be skewed in some years depending on which watersheds are being analyzed or re-analyzed.

Table F-3-2 and the Water Yield Analysis Map present an estimation of the Forest-wide condition based on a computer file of watersheds that is updated each year to indicate the results of the most current water yield analysis.

Table F-3-1 shows the results for each fiscal year. In FY99, the water yield model was used to estimate the peak flow increase on 172,538 acres of both National Forest and private land. Most of these watersheds had been analyzed in previous years and include many acres of private land. Of the total area analyzed during this fiscal year, 7 percent of the acres exceed Forest water yield guidelines. Channel damage has not necessarily occurred in watersheds shown to be exceeding water yield guidelines, since this monitoring item is based on computer modeling and not field observations and measurements.

Table F-3-1 Watersheds Analyzed for all Ranger Districts by Fiscal Year

Fiscal Year	Total Acres of Watersheds Analyzed	Acres of Watersheds Exceeding WY Guidelines	Percent of Analyzed Acres Exceeding WY Guidelines
88-89	944,170	314,404	33%
90	141,054	14,564	10%
91	226,836	13,020	6%
92	163,297	59,661	37%
93	83,479	16,654	20%
94	130,890	59,597	46%
95	277,229	29,682	11%
96	223,545	45,758	20%
97	141,171	16,827	12%
98	539,652	218,197	40%
99	172,538	11,777	7%



Some of the totals in Table F-3-1 include reassessments of previously completed watersheds because of changed conditions. For instance, FY94 includes a large number of acres that were reanalyzed following fires. Many of those acres had been analyzed earlier as part of normal operations. It is also important to note that, in areas analyzed in earlier years, hydrologic recovery has been occurring and watershed restoration projects have been implemented. Due to these changed conditions, some of these areas may not exceed water yield guidelines today. Because of the reassessments done in later years, the information in Table F-3-1 cannot be totaled since some acres would be double-counted.

The second method used summarizes the most recent analysis results for each watershed. This enables us to show a total for the Forest. This data is summarized to generate the figures for Table F-3-2. The map on the following page (Figure F-3-1) is shaded to show where watersheds have been analyzed and most recent analysis shows they meet or exceed Water Yield Guidelines. As noted above, some of these areas were last analyzed up to ten years ago and conditions may have changed.

As shown in Table F-3-2, over 2,000,000 acres have been analyzed for water yield conditions on the Kootenai since 1988. Of this total, 1,560,420 acres (77 percent) were found to be at or below the guidelines and 477,448 acres (23 percent) were found to be over guidelines according to the most recent analysis in each area, which could be up to ten years ago.

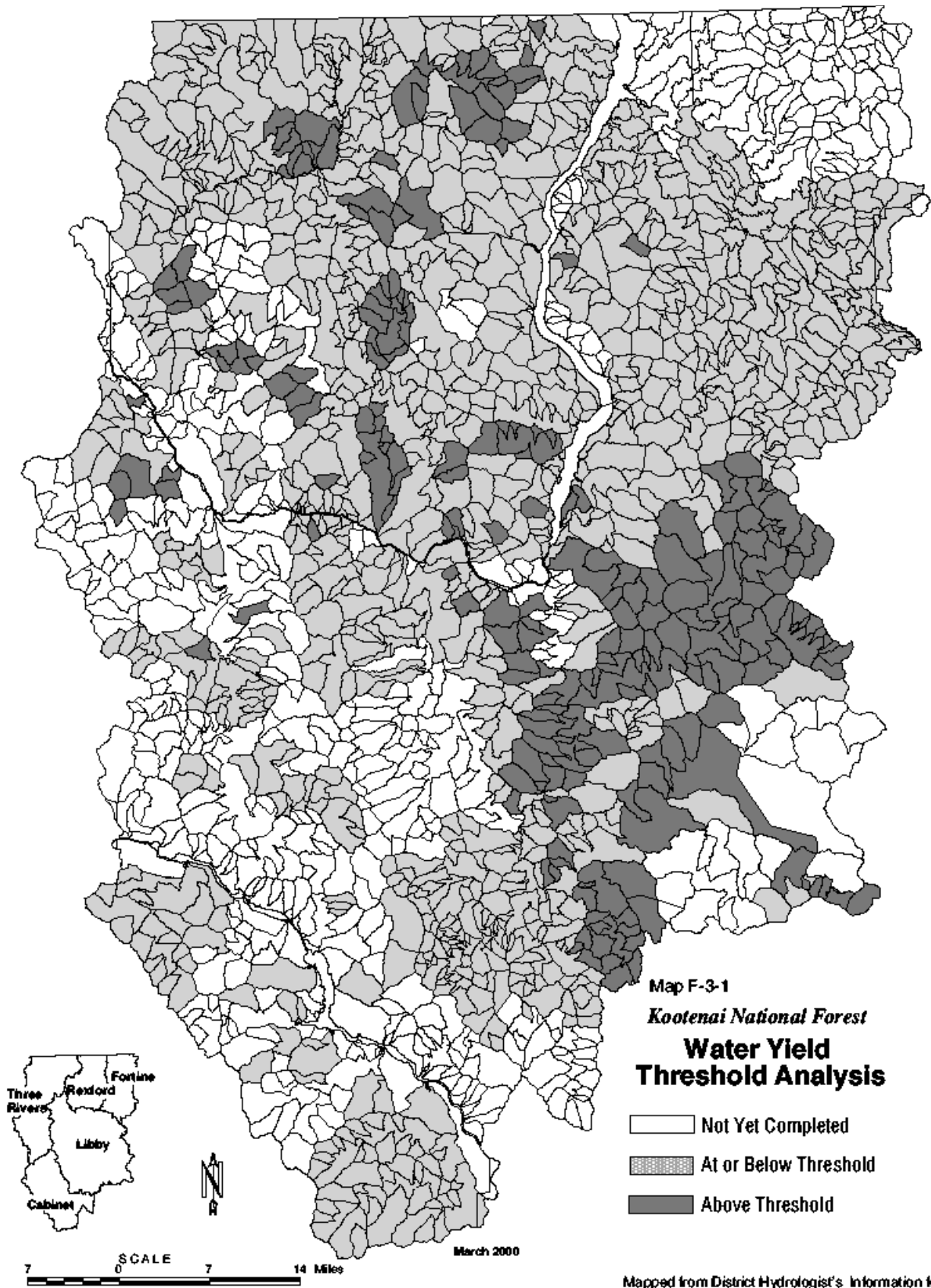
Table F-3-2 **Summary of Watershed Analysis Results** (includes private land)

Fiscal Years	Acres of Watersheds Analyzed	Acres (and percent) of Watersheds That Meet WY Guidelines	Acres (and percent) of Watersheds Exceeding WY Guidelines
FY 88- FY 99	2,037,868	1,560,420 77%	477,448 23%

Evaluation: Table F-3-1 shows 7 percent of the analyzed watershed acreage for FY99 exceed the peak flow water yield guidelines. As in prior years, the reasons for these current conditions are usually related to harvesting of timber in years prior to the implementation of the Plan, timber harvest on private lands, and relatively slow recovery of vegetation in certain watersheds. In addition, natural events such as wildfire have caused high mortality of trees in certain areas, resulting in conditions that cause increased runoff and peak flow increases. When such conditions are encountered in the project planning process, projects are designed so that peak flows still meet the Forest Plan guidelines to protect water quality and beneficial uses.

Table F-3-2 indicates that, for the period from FY 88 to FY99, about 23 percent of the watershed acreage, including private land, is exceeding water yield guidelines. Map F-3-1 shows the watersheds where peak flow analysis has been done in one or more Fiscal Years since 1988 and also shows the results of the most current analysis.

This monitoring item continues to be off-track with the Forest Plan. It is important to note, however, that when projects are proposed in watersheds that are over the standard, they are designed to improve the long-term watershed condition, rescheduled, or dropped (See Monitoring Items E-1 and E-7). This monitoring item shows that water yield calculations and stream channel analysis is an important part of the analysis needed before projects can be implemented.



Map F-3-1
Kootenai National Forest
**Water Yield
 Threshold Analysis**

- Not Yet Completed
- At or Below Threshold
- Above Threshold



7 SCALE 7 14 Miles

March 2000

Mapped from District Hydrologist's Information for Fiscal Year 1999, shown by watershed.

HUMAN & COMMUNITY DEVELOPMENT: Emerging Issues; Monitoring Item H-2

ACTION OR EFFECT TO BE MEASURED:

Emerging issues.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:

Issues surfaced that were not included in or analyzed for effect by the Forest Plan.



Purpose: This monitoring item was established to track the amount of resource management conflict that is occurring, especially those conflicts which were not foreseen during the preparation of the Forest Plan. The Plan requires that this item be reported annually. The expected accuracy and reliability of the information are both moderate.

Background: New emerging issues could affect the Forest's ability to implement the Plan as intended, so they are identified as part of monitoring.

EMERGING OR POTENTIAL FOREST ISSUES NOT SPECIFICALLY EVALUATED IN THE FOREST PLAN:

Roads and Associated Access Issues:

Road Maintenance: The inability to maintain existing roads to an acceptable standard has become a concern both internally and with the public. There is a conflicting need to improve watershed conditions with the need to maintain public access.

Road Closures: Road closures in general have become part of public concern over federal vs local control.

Access: Public comments include concerns about access to the forest for a variety of reasons, including snowmobile or OHV use in Recommended Wilderness areas. There is a conflicting need to provide back-country winter access with the need to maintain habitat security for lynx and other species. There is also a conflicting need to provide access to private lands (ANILCA) with a need to maintain habitat security, especially for grizzly bear. Current National Initiatives, if implemented, will change current plan management direction.

Timber Harvest Concerns: Declining level of timber harvest will impact area mills and loggers, county budgets and general economic development. .

Economic Effects of Timber Harvest: Public comments have been made that timber harvest on public land will have a negative effect on the value of adjacent private property and decrease the attraction of the area for tourists.

Land Uses: There is an increasing demand for use of National Forest System lands. This is putting stress on conflicting resource values and the ability of the Agency to address them in a timely manner.

Community Relations: There is public perception that the Forest Service is not fulfilling its responsibility as a partner in rural community development. This issue is also related to the decline in timber harvest and road closures. The regional/national initiatives related to roadless areas, planning regulations and transportation management are a source of local frustration. Local people feel left out of the process.

CONTINUING FOREST ISSUES THAT MAY STILL AFFECT THE FOREST PLAN:

The Forest Plan initially identified and addressed 13 public issues. As stated in the FY92 Monitoring Report, of these original 13 issues, the following are still current issues: grizzly bear management, timber supply (local economic impact), road management and public access, potential mineral development, visual (scenic) quality, and community stability (in the broader sense of using the natural resources of National Forest lands to provide jobs related to recreation, tourism, and forest products other than timber).

Recommended Actions: These emerging issues and those identified in previous reports will be reviewed during Forest Plan revision to determine if and how they should be resolved.

HUMAN & COMMUNITY DEVELOPMENT: Forest Plan Costs; Monitoring Item H-3

ACTION OR EFFECT TO BE MEASURED:	Determine if the costs of producing outputs that were used in the Forest Plan continue to be valid.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	A deviation of more than 10 percent from the cost data used to calculate present net value in the Forest Plan.



Purpose: This monitoring item was established to track the cost of major items contributing to the present net value of the Forest Plan. The Plan requires that this item be reported annually. The expected accuracy and reliability of the information are moderate to high.

Background: During the development of the Plan, cost data were broken down into fixed, other, and variable costs. Fixed costs consisted of 45 categories of costs and these items were the same for all alternatives considered. Other costs include 16 categories of cost items that were lumped but varied by alternative. Variable costs consisted of certain recreation costs, wildlife habitat improvement costs, range management and improvement costs, and all timber-related costs. These breakdowns were consistent with analytical techniques used for the Plan, but do not compare directly with accounting classifications (different breakdowns) now in use. As a result, only some of the variable costs can be readily used to determine changes in unit costs. However, the ones used are the variable cost items that influenced land allocation and activity scheduling in the Plan and indicate trends in unit cost change for monitoring purposes.

Cost analysis was undertaken for timber sale preparation and administration (site preparation, reforestation, precommercial thinning) and roads constructed primarily for timber harvest. The base line unit cost figures (those used to calculate Present Net Value in the Plan) were extracted from the planning record and inflated to 1999 dollars in order to provide comparability. The fiscal year unit cost values were obtained from Forest accounting reports and Forest management attainment reports. Timber sale preparation costs include all planning, sale preparation, and sale administration expenditures for the fiscal year. Timber output is based on the amount sold in the fiscal year. Timber road costs are based on purchaser credit established and associated engineering support costs. In FY99, changes were made to the Forest Service accounting system and it is no longer possible to separate timber road costs from all other road costs. For this report, total road construction and reconstruction support costs were used, resulting in an over-estimate of unit costs. Also effective in FY99 was the elimination of purchaser credit. Purchaser credit is no longer in effect or calculated for timber sales. Because of these two changes, the ability to monitor unit costs for timber roads is greatly diminished. Reforestation costs include all reforestation-related costs including cooperative work required by timber sale contractors. All acres with reforestation work are represented in the output level. Table H-3-1 shows the base line, the average inflation-adjusted costs for FY93-98, and FY99 unit cost data for these items.

Results and Evaluation:

Timber Sales unit costs for FY99 decreased from the average in the preceding six years. However, costs are three times greater than projected, which is well outside the +/- 10 percent range prescribed in the Plan. This increase is due to the increasing complexity in timber sale preparation, along with a concurrent decrease in the amount of timber volume being sold. For more detail on these aspects, please refer to Monitoring Items E-1 through E-3 and E-7.

Timber Roads unit costs were \$28 per MBF in FY99, which is a decrease from the average of the preceding six years. The FY99 cost is actually lower than the cost predicted in the Forest Plan. The reduction in unit costs is reflective of a reduced amount of road construction and reconstruction. Monitoring has shown that this value varies from year to year as a result of changing harvest and road construction emphasis, so it is expected that this cost will continue to hover around the long term averages.

Reforestation unit costs were slightly lower than the last six years, but approximately 24 percent higher than the projected Forest Plan amount. As discussed in preceding monitoring reports, since reforestation is a relatively large component of the timber program, this additional cost is a potentially significant change in the economic efficiency levels of the Forest.

Precommercial thinning unit costs continues to stay well below projected costs, helping the Forest to minimize overall costs. However, in terms of the total PNV of the Plan, precommercial thinning accounts for only 0.2 percent of the total contribution to PNV costs, so the overall economic efficiency is only slightly affected.

Recommended Actions: Since timber sale and reforestation unit costs are significantly higher than projected levels in timber sales and reforestation, there will be a need to factor in such changes during Forest Plan revision. Changes to the accounting system have made unit costs for timber roads more difficult to track in the future. During the revision process, cost efficiency analysis will include these elements and others as appropriate.

Table H-3-1 **Forest Plan Unit Costs by Fiscal Year***

Cost Item	Units	Unit Costs Projected in Plan	Weighted Average FY 93-98	FY 99
Timber Sales	\$/MBF	31	113	94
Timber Roads	\$/MBF	32	46	28
Reforestation	\$/acre	365	454	452
Precommercial Thinning	\$/acre	327	241	234

* All unit costs in this table have been updated to 1999 dollars to account for inflation and provide for comparison.

HUMAN & COMMUNITY DEVELOPMENT: Forest Plan Budget: Monitoring Item H-4

ACTION OR EFFECT TO BE MEASURED:	Assess Forest budget levels and their effects on Forest Plan implementation
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION	10 percent deviation by funding item from the predicted levels in the Forest Plan.



Purpose: This monitoring item was established to track the budget levels received from Congress. The Forest Plan requires that this item be reported annually. The expected accuracy and reliability of the information are both high.

Background: The budget process is directly related to the Plan, but also influenced by other factors. Program targets vary from year to year to meet certain needs and such changes are reflected in the budget figures. As a result, budget levels for any single year should be interpreted with care. However, given major trends now seen since 1988, it is apparent that many programs and costs have changed substantially, and Plan predictions are no longer fully valid. The analysis presented below will be helpful in budget analysis for Forest Plan revision.

Results: Table H-4-1 shows the percentage difference between the planned and actual budgets for FY99. Major increases have occurred in fire, fuels, range, law enforcement, timber salvage sales, trail construction and tree improvement.

Evaluation: In order to evaluate this information with its wide variations, the major Forest programs were grouped for easier comparison. For each major Forest program (such as timber, wildlife, recreation) all applicable budget items shown in Table H-4-1 were grouped and added together. Output levels for each major resource area were obtained from Appendix A (at the end of this report) and are based on the Forest's Management Attainment Report for FY99. For each major program area, all applicable outputs were added together. To some extent, some misrepresentation was introduced by this addition (for instance, developed recreation and dispersed recreation) but overall results do show the major trends. Budget and output data were averaged over the last 12 years to smooth out year-to-year variations. Table H-4-2, on a following page, shows the results of this analysis. Below is a brief listing of each program area, the outputs contributing to it, and an evaluation of the trend.

Minerals (number of cases handled): The number of minerals cases is not a controllable item, because the Forest is required to respond to cases as they arise. Although a considerable number of cases have been completed, many of them have been less complicated than the expected long-term average.

Protection (natural fuels treatment, in acres): Continuing the trend which began in FYs 92 and 93, the acres of natural fuels treatments went up substantially over prior years (see Appendix A). As a result, the level of accomplishment is continuing very high, at 477 percent of the planned amount.

Table H-4-1 **FY99 Budget as a Percent of Forest Plan Projected Amount**

Item	Budget Activity	Planned Amount Base Year 1978	Planned Amount Base Year 1999	FY 99 Actual Amount	FY 99 Actual % of 1999 Planned Base
00	General Administration	1,465	3,340	1,326	40%
01	Fire	530	1,208	1,837	152%
02	Fuels	59	135	642	477%
03-05	Timber	2,648	6,037	2,300	38%
06-07	Range	59	135	230	171%
08	Minerals	287	654	468	72%
09	Recreation	561	1,279	979	77%
10	Wildlife and Fish	648	1,477	560	38%
11	Soil, Air, Water	269	613	354	58%
12	Facility Maintenance	145	331	303	92%
13-15	Lands/ Land Management	156	356	312	88%
42-43	Lands-Status/ Acquisition	96	219	30	14%
16	Landline Location	285	650	159	24%
17	Road Maintenance	764	1,742	1,103	63%
18	Trail Maintenance	115	262	199	76%
19	Co-op Law Enforcement	12	27	55	201%
20	Reforestation (appropriated)	871	1,986	689	35%
21	TSI (appropriated)	562	1,281	676	53%
23	Tree Improvement	20	46	81	178%
26-28	KV (Trust Fund)	1,427	3,254	2,299	71%
29	CFWS - Other (Trust Fund)	348	793	587	74%
30	Timber Salv Sales Perm Fund	275	627	5,526	881%
31	Brush Disposal (Perm Fund)	694	1,582	750	47%
32	Range Improvement	6	14	4	29%
33	Recreation Construction	99	226	205	91%
34	Facility Construction: FA&O	111	253	0	0%
35	Engineering Const. Support	2,360	5,381	736	14%
36	Const. Capital Invest Roads	1,801	4,106	651	16%
37	Trail Const/ Reconstruction	32	73	144	197%
24/ 38	Timber Road Const.: PC/Elect.	2,399	5,470	998	18%

Table H-4-2 **Forest Plan Budget & Output (Averages for FY88 – FY99)**

Activity or Output	Actual Budget as a Percent of Forest Plan	Actual Output as a Percent of Forest Plan
Minerals	63	64
Protection, Natural Fuels Treatment	146	267
Range	115	86
Recreation	69	160
Reforestation	98	78
Timber	53	49
Timber Stand Improvement	76	86
Wildlife	49	52

Range (permitted grazing use): The range budget has averaged 15% above Forest Plan projections while production amounts are below those shown in the Plan. See Item D-1 for more information.

Recreation (Total of developed and dispersed use, in recreation visitor days): Compared to the Plan, recreation budgets are lower and outputs are higher. Continuing difficulty in obtaining full funding on a national basis affects this program area. Outputs, however, are steadily increasing as more people volunteer and challenge grants help reduce this gap between planned and realized funding. Recreation experience quality could diminish if the current cooperation diminishes and the budget gap continues. The low reliability and accuracy of the dispersed recreation use data (using traffic counts to calculate driving for pleasure and viewing values, for example) may also be a contributing factor to the large overrun of outputs.

Reforestation (Acres reforested naturally and artificially, by Forest and cooperators): Reforestation budgets have been close to those projected in the Plan while outputs are at a reduced level. See Monitoring Item H-3 for a discussion of reforestation unit costs.

Timber (Total volume sold, MMBF): Both timber budgets and outputs are less than planned. See Monitoring Item H-3 for a discussion of timber unit costs and Monitoring Item E-1 for timber sell volume information.

Timber Stand Improvement (Acres precommercially thinned): Actual costs for precommercial thinning have been less than those anticipated. Acreage thinned has not fully reached expected levels due to budget limits.

Wildlife and Fish (Total acres of wildlife, fish, and T & E habitat improvement): Budgets in this area average around 49 percent of planned amounts. Accomplishment also remains lower than expected at about 52 percent. These budgets show a decline beginning in FY93 and continuing through FY99. Much of this decrease in the wildlife budget was due to a change in the accounting system. This change in the accounting system and the subsequent reduction in fish and wildlife funds reduces the ability of the Forest to undertake habitat improvement work. However, because of increased cooperative work and volunteer efforts, output levels were up in FY99.

Conclusion: Based on the information stated above, this monitoring item is outside the range prescribed in the Plan.

Recommended Actions: Continue monitoring.

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

ACTION OR EFFECT TO BE MEASURED: Determine the level of insect and disease organisms following management activities to ensure the health of residual and surrounding stands.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Insect and disease levels increase beyond normal levels.



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

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

Results: Densely growing trees, regardless of size, can come under stress, often predisposing them to insect and/or disease attack. Commercial (2978 acres) and precommercial thinning (7418 acres) treatments have occurred on the Forest over the last two fiscal years. Both treatments include reduction of stocking levels to reduce stress while improving species mixtures that are less susceptible to insect and disease problems. Insect and disease damaged trees are normally reduced during these operations. Mistletoe infected overstory trees on recently regenerated stands have been reduced on over 7000 acres. Pruning of white pine blister rust infected western white pine occurred on 28 acres. Prescribed burning following harvest and for wildlife habitat improvement sometimes increases insect activity, but at a low level.

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

The Forest surveyed about 16,500 acres for dwarf mistletoe infection in FY98 and FY99. We found few infections in the seedling and sapling size class but did find infection in mature trees of western larch, lodgepole pine, and Douglas fir in or adjacent to many plantations that pose a threat to spreading this disease. Follow-up treatments are proposed in stands that may cause subsequent problems in regenerated stands. 479 acres of mistletoe-infected overstory trees were treated in FY98 and FY99.

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

White pine blister rust continues to infect natural white pine at a high rate. We rarely feature natural white pine as a crop tree, so this condition does not pose a threat to the forest timber resource productivity. However, in stands where natural white pine is intended to remain a part of the stand composition and infection levels are moderate, branch pruning is being used to reduce infection levels.

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

Appendix A: Planned Output or Activities and Accomplishments

Actual Accomplishments						
Target Item	Output or Activity	Unit of Measure	Planned Units	FY 1999	FY88-99 Average	FY88-99 Ave. % of Planned Units
Recreation	Developed Use	M RVD	297	346	273.2	92%
	Dispersed Use: Wilderness	M RVD	18	19	24.3	135%
	Non-Wilderness	M RVD	559	1,001	1,103.4	197%
Wildlife and Fish	Wildlife Habitat Improvement	Acres	5,600	4,282	2,823.3	50%
	T & E Habitat Improvement	Acres	150	0	117.7	78%
	Fish Habitat Improvement	Acres	120	31	123	103%
Range	Authorized Grazing Use ²	M AUM	12.6	7.8	10.8	86%
Soil	Soil Inventory	M Acres	15.7	0	5.0	32%
Lands	Land Exchange	Acres	1,700	0	1,950.9	115%
Minerals	Minerals Management	Cases	300	183	191	64%
Protection	Fuels Treatment, Natural	Acres	800	7,907	2,139.5	267%
Timber	Total Volume Offered	MMBF	233	49.6	113.6	49%
	Reforestation (appropriated)	M Acres	3.0	1.8	3.0	102%
	Reforestation (KV)	M Acres	7.1	3.0	6.3	89%
	Reforestation (Other, Co-op)	M Acres	4.0	0.2	1.7	42%
	Total Reforestation	M Acres	14.1	5.0	11.0	78%
	Timber Stand Improv (appropriated)	M Acres	4.0	3.2	3.4	85%
	Timber Stand Improv (KV)	M Acres	1.0	0.7	0.9	93%
	Total Timber Stand Improv	M Acres	5.0	3.9	4.3	86%
	Stand Examination	M Acres	139.0	32.6	135.6	98%
	Fuel Treatment (BD/ KV)	M Acres	11.7	4.9	8.3	71%
Facilities	Total Road Construction	Miles	237.0	7.2	47.4	20%
	Trail Construct/ Reconstruct	Miles	7.5	16.5	11.0	146%

² Authorized grazing use is the amount of grazing that is billed for a season. Permitted use is the amount on the grazing permit and may be higher than the authorized amount, due to fluctuations in herd size, change in weather, etc.

APPENDIX B: Timber Sell Volume: Monitoring Item E-1

The following Table shows actual accomplishments compared to Forest Plan projections. All values are shown in million board feet (MMBF). Please see Monitoring Item E-1 for details. For individual years 1988-1997 data, see the FY97 Forest Plan Monitoring Report.

SUITABLE LANDS				
	Forest Plan ASQ	Total Amount FY 88-99	Average Per Year	Amount FY 1999
ASQ:				
Regulated	202	956.6	79.7	50.1
Non-Interchangeable				
Dead LPP	20	218.1	18.2	22.3
Other Dead	5	162.1	13.5	7.4
Total Non-Interchangeable	25	380.2	31.7	29.7
Total Chargeable	227	1,336.8	111.4	79.8
Non-Chargeable ³				
Roundwood	0	8.5	0.7	0.4
Fuelwood	0	29.5	2.5	2.3
Total Non-Chargeable	0	38.1	3.2	2.8
UNSUITABLE LANDS				
All Unregulated	6	18.3	1.5	1.9
FINANCED SELL VOLUME				
Total Volume	233	1,393.1	116.1	84.5

³ Woody material that is sold, but not accounted for in Appendix 11 of the Forest Plan. Roundwood is small material not meeting Region 1 forest planning sawlog specifications and usually removed as post, pole, or rail products.
NOTE: Totals may not be exact because of rounding.

APPENDIX C: Openings Greater than 40 Acres

The National Forest Management Act (NFMA) provides direction for development and implementation of land and resource management plans. Secretary of Agriculture regulations of 36 CFR 219 provide guidance for implementing NFMA provisions. Section 219.27 (d)(2)(iii) states that "...the established limit shall not apply to the size of areas harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm."

Furthermore, the Northern Regional Guide, 36 CFR 219.8, states, "Where natural catastrophic events such as fire, windstorm, or insect and disease attacks have occurred, 40 acres may be exceeded without 60-day public review and Regional Forester approval, provided that the public is notified in advance and the environmental analysis supports the decision" (Regional Guide, page 2-6). This same direction is repeated in the Regional Supplement to Forest Service Manual 2471.1.

The Forest Plan also provides direction regarding opening sizes: "...maintain a variety of unit sizes of generally 40 acres or less. Where catastrophic conditions such as insects, disease, or fire create a condition whereby larger unit sizes will have no additional effect on wildlife habitat, larger cutting units may be used" (Forest Plan, p II-23). The intent of this statement is to ensure that any activity hastens recovery for wildlife and there are no long-term detrimental effects by exceeding 40 acres.

The following projects were approved by the Forest Supervisor to exceed opening sizes and, therefore, are consistent with Forest Plan direction.

Fiscal Year	Project Name	Total Acres of Openings	MA	Years to Recovery	Comments
1998	Beaver Creek	121	12	3-17	Harvest of 1 unit (77 acres) adjacent to 5 existing units (44 acres). Lessen effects of root disease, manage for larger patch sizes to reduce need for road construction, increase forage, modify appearance of existing units.
		54	12	3-17	Harvest of 1 unit (54 acres). Lessen effects of root disease, manage for larger patch sizes, reducing need for road construction, increase forage, modify appearance of existing units.
1998	No Fork Jackson	58	12	15	Harvest beetle-killed lodgepole in 1 unit (18 acres) adjacent to 33 acres of previous harvest. Hasten recovery for wildlife large contiguous patches.
		51	15	5	Harvest beetle-killed lodgepole in 2 units (37 acres) adjacent to 21 acres previous harvest. Hasten recovery for wildlife large contiguous patches.
1998	Holy Rabbit	150	12	4-15	Salvage dead and down timber with high level of mortality and blowdown. Harvest 2 units (12 acres) adjacent to 7 existing units (138 acres).
		396	12	1-15	Salvage dead and down timber with high level of mortality and blowdown. Harvest 2 units (37 acres) adjacent to 21 acres previous harvest.

Fiscal Year	Project Name	Total Acres of Openings	MA	Years to Recovery	Comments
1998	Upper Barron	77	15	3-5	Salvage dead and down lodgepole, decrease fuel loads. 1 unit (30 acres) adjacent to 47 acres previous harvest.
		45	15	3-5	Salvage dead and down lodgepole timber, decrease fuel loads. 1 unit (45 acres).
		56	15	3-5	Salvage dead and down lodgepole timber, decrease fuel loads. 1 unit (19 acres) adjacent to 37 acres harvested.
1998	Grubb Salv.	45	15	15	Salvage dead and down lodgepole, decrease fuel loads. 1 unit (8 acres) adjacent to 37 acres previous harvest.
1998	West Dry II	92	12	15	Harvest 1 unit (24 acres) adjacent to 68 acres previous harvest. Salvage dead and down lodgepole timber, decrease fuel loads.
1998	Meadow	46	15	3-5	Harvest to meet desired landscape composition, structure and function in 3 units (11, 25 and 10 acres)
		45	15	3-5	Harvest to meet desired landscape composition, structure and function in 3 units (16,6 and 23 acres)
		129	15	3-5	Harvest to meet desired landscape composition, structure and function in 7 units (20, 8, 22, 20, 35, 15 and 9 acres)
		101	15-16	3-17	Harvest to meet desired landscape composition, structure and function in 3 units (23, 35 and 43 acres)
		104	15-16	3-17	Harvest to meet desired landscape composition, structure and function in 3 units (20, 27 and 57 acres)
1999	Clay Beaver	91	11	15	Allow modification of forest conditions to complement landscape-level desired composition, structure and function objectives.
		53	14	15	Allow modification of forest conditions to complement landscape-level desired composition, structure and function objectives.
		110	12	15	Allow modification of forest conditions to complement landscape-level desired composition, structure and function objectives. Harvest of 72 acres adjacent to 67 acres previous harvest.
		51	11	15	Allow modification of forest conditions to complement landscape-level desired composition, structure and function objectives.
1999	Pinkham	200	12	10-20	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future. Harvest of 120 acres adjacent to 80 acres previous harvest.
		105	12	10-20	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future.
		93	15	5	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future.

Fiscal Year	Project Name	Total Acres of Openings	MA	Years to Recovery	Comments
1999	Pinkham (continued)	127	12	10-20	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future. Harvest of 93 acres adjacent to 34 acres previous harvest.
		56	12	10-20	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future. Harvest of 28 acres adjacent to 28 acres previous harvest.
		254	12	10-20	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future. Harvest of 166 acres adjacent to 88 acres previous harvest.
		156	12	10-20	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future. Harvest of 143 acres adjacent to 13 acres previous harvest.
		127	15	5	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future.
		44	15	5	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future.
		66	14/ 15	5	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future.
		45	15	5	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future.
		51	15	5	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future.
		174	15	5	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future. Harvest of 51 acres adjacent to 129 acres previous harvest.
		180	15	5	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future.
		77	15	5	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future.
		167	15	5	Reduce fire risk, reduce susceptibility to root disease and Douglas-fir beetle, help provide large patches to be managed as mature and old forest in the future.

Fiscal Year	Project Name	Total Acres of Openings	MA	Years to Recovery	Comments
1999	Dry Pocks	90	12	15	Salvage of dead and windthrown stands killed in Dry Fork fire, decrease fire risk. Harvest of 32 acres adjacent to 58 acres previous harvest.
		222	12	15	Salvage of dead and windthrown stands killed in Dry Fork fire, decrease fire risk. Harvest of 92 acres adjacent to 130 acres previous harvest.
		49	12	15	Salvage of dead and windthrown stands killed in Dry Fork fire, decrease fire risk. Harvest of 42 acres adjacent to 9 acres previous harvest.
		49	12	15	Salvage of dead and windthrown stands killed in Dry Fork fire, decrease fire risk.
1999	Deer Marl Parsnip	124	12	15	Salvage of beetle-killed and windthrown lodgepole.
1999		270	12	15	Unit 1 (91 acres) adds to existing salvage of beetle-killed and windthrown lodgepole.
		268	12	15	Units 2 & 9 (21 and 5 acres) add to existing salvage of beetle-killed and windthrown lodgepole.
		143	12	15	Units 3 & 4 (11 and 18 acres) add to existing salvage of beetle-killed and windthrown lodgepole.
		514	12	15	Units 5, 8, 6, & 7 (18, 11, 32, 22 acres) add to existing salvage of beetle-killed and windthrown lodgepole.

APPENDIX D: Programmatic Amendments

The Forest Plan provides a process for amending the Plan. Amendments are effective until Forest Plan revision or until they are changed. The following amendments approved in FY98

No. 14 3/99 Forest Plan in Management Area (MA) 12 is modified for the "Facilities" section, standard #3, to allow an open-road density of 1.5 miles per square mile during non-activity periods, and 2.6 miles per square mile during activity periods in compartment 592, (Chief, Marl, Deer and Tesnsaw Creek) on the Libby Ranger District.

No. 15 6/99 Forest Plan in Management Area (MA) 12 is modified for the "Facilities" section, standard #3, to allow an open-road density of 1.51 miles per square mile during non-activity periods, and 1.81 miles per square mile during activity periods in compartment 18 and 21, (Pinkham Planning Area) on the Rexford Ranger District.

APPENDIX F: List of Preparers

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