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Forest Plan Monitoring Report for Fiscal Year 1991

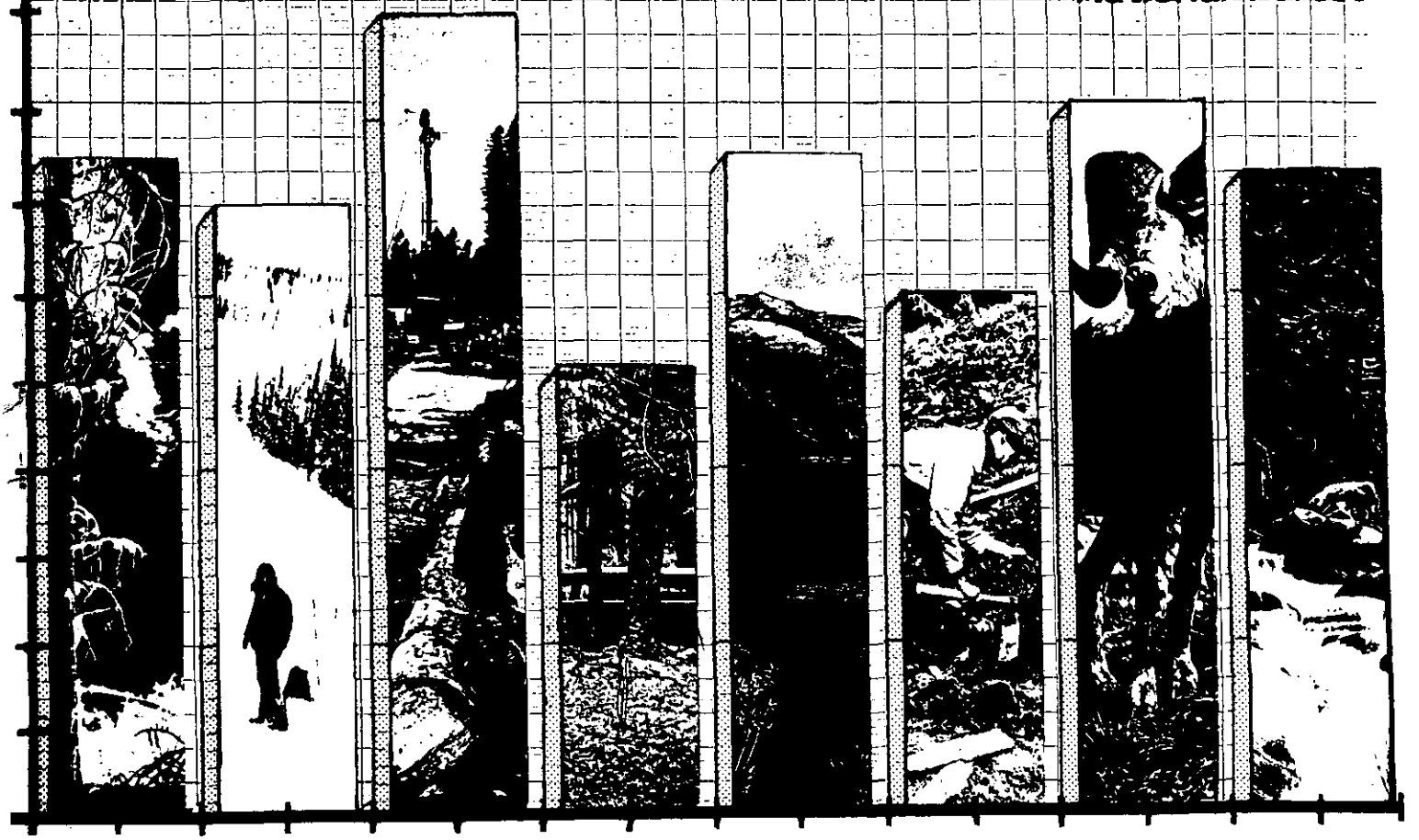
February 1992

Kootenai National Forest Plan

United States Department of Agriculture

Forest Service

Kootenai National Forest



United States Department of Agriculture | Forest Service | Kootenai National Forest | 506 US Highway 2 West Libby, Montana 59923 (406) 293-6211

Reply to: 1920

Date: February 24, 1992

Dear Forest Planning Participant:

Enclosed is the Kootenai Forest Plan Monitoring Report for fiscal year 1991. It shows how we are doing since the Plan was approved in September, 1987. I hope it will help you understand how the management of some of the major Forest resources has progressed during the last four years.

The results show that Forest Plan implementation is progressing well in many areas, is uncertain due to incomplete results in a few areas, and is not meeting expectations in some other areas. The major area where expectations are not being met, and one which is of particular interest to our local communities, is the amount of timber volume being sold. There are several reasons why the volume of timber sold is not meeting the Forest Plan projections and they are described in the Report.

The Kootenai Forest program for fiscal year 1992 indicates a continuation of the trends established since fiscal year 1988, the first year after the Plan was approved. Based on a reasonable projection, the Forest may not need the full 5-year evaluation period to determine a need for change. The 5-year review point is the normal time to take a look at how the Forest Plan is operating, and was established in the Monitoring section of the Plan (Chapter IV).

If you have any questions about this report, please contact the District Ranger nearest you (listed in Appendix C at the back of this report), or Paul Leimbach here at the Forest Supervisor's Office in Libby.

Robert L. Schrenk

ROBERT L. SCHRENK
Forest Supervisor

Forest Plan Monitoring Report for Fiscal Year 1991

Kootenai National Forest
February, 1992

TABLE OF CONTENTS

Forest Plan Annual Monitoring Report for Fiscal Year 1991

Kootenai National Forest
February, 1992

INTRODUCTION

We have recently completed the monitoring of Forest Plan implementation for fiscal year 1991. This was the fourth year of operation under the Plan, and includes the period from October 1, 1990 to September 30, 1991.

Background: The Forest Plan for the Kootenai National Forest was approved on September 14, 1987. It established management direction on the Forest for a 10-year period that began on October 1, 1987 (fiscal year 1988). This direction was the result of a comprehensive analysis of land capabilities, public issues, environmental effects, and a balancing of intense public concerns as well as legal requirements.

Forest Plan Monitoring provides us an opportunity to periodically check and determine if we are proceeding on course with the Plan's direction. It includes checks for implementation, effectiveness, and validation. Implementation monitoring can be summarized as **"did we do what we said we would do?"** Effectiveness monitoring is summarized as ***"did the management practices do what we wanted them to do?"*** *Validation* monitoring is a process used to determine if the Plan's assumptions and data calculations are still correct.

Process: At this point in our Plan period, our concern is still mostly with implementation and effectiveness *monitoring, although some validation concerns* have also surfaced. The Plan's guidance for monitoring is found in Chapter IV of the Forest Plan. It lists specific items that we're tracking during implementation monitoring. It also provides guidance to help determine if implementation is within the stated variability limits. If an item is not within the stated limit, an evaluation is undertaken to find the reason for the deviation. The Forest can then take any needed steps to bring the implementation within the desired limits.

The information that we gain from this periodic monitoring will be used for our formal 5-year Plan review which is presently scheduled to begin after October 1, 1992. As indicated in the Forest Plan, there are 39 items to be measured on a yearly basis. Of the 39 items, 13 are to be reported on an annual basis and 4 need to be reported every other year. The remaining 22 items are reported on a 5-year basis. This 4th-year report will discuss both the annual and bi-annual items. In addition to these 17 items, another monitoring item was assigned in 1991 (Clearcut Acres Sold). It is also an annual reporting item and has been included in this report.

Procedure: For each of the 18 monitoring items, we first checked to see if it was within the desired limits of variability. If it was, then we concluded there was adequate compliance with the Plan. In some cases, we found that we could currently be within the required limits, but the 4-year trend indicates that the allowable variation will be exceeded by the time the 5-year review begins. For these items, we are working to get back into the allowable variation during the next year and will continue to monitor in preparation for the formal 5-year review. Finally, there are monitoring items that we found are not currently within the desired variability limits, and the trend indicates that it will not be possible to feasibly reach those limits. For these items, the Forest is closely monitoring them so that adequate information will be available at the 5-year review to determine what changes may be needed.

SUMMARY

When we answer the question **"Did we do what the Plan said we should do?"**, we find adequate information to say **YES** for seven (7) monitoring items because we're either within the Plan's stated limits or **ON-TRACK** and moving toward those limits. For another seven (7) items, we find adequate information to say **NO** because we're either outside the Plan's stated limits or **OFF-TRACK** and moving away from those limits. Three (3) other items have **inadequate results** to draw any supportable conclusions, and one (1) item **doesn't fit** into any of these three categories.

The monitoring items where we can say **"YES** we're in compliance with the Plan", or we're **ON-TRACK** and moving toward that compliance, include: **Old-Growth Habitat, Threatened and Endangered (T & E) Species Habitat, Range Use, Harvest Area Size, Clearcut Acres Sold, Water Yield Increases**, and **Insect and Disease Status**. Specifically, here is what we found for these items:

Old-Growth Habitat (C-5): The Forest Plan requires that 10% of the land area be protected to provide old-growth habitat. This is a commitment of 186,500 acres across the Forest. Old-growth habitat is necessary to support viable populations of dependent wildlife species. As we proceed with site-specific project planning, we're checking the quantity and quality of old-growth habitat before any projects are authorized. After four years, we've completed the necessary surveys on almost 582,000 acres, which is about 31% of the total Forest area to be validated. The results show we've protected almost 68,500 acres of old-growth habitat on the completed portion. For this validated portion, we are at 11.8% which is above the required 10% level.

T & E Species Habitat (C-7): Through this item we're monitoring the quantity and quality of habitat for the recovery of peregrine falcons, gray wolves, bald eagles and grizzly bears. We're also observing the animals to obtain population estimates and trends. We haven't observed any peregrine falcons in FY 1991, but we have numerous sightings for bald eagles, gray wolves and grizzly bears. Habitat and population information indicates that the bald eagle could be considered for downlisting in the near future. Our information also indicates that grizzly bear habitat effectiveness is now above the Forest Plan standard on an ecosystem average. Overall, the amount and quality of habitat for all these species is being improved or maintained, and we're progressing well toward meeting recovery plan goals.

Harvest Area Size (E-8): The Forest Plan provides standards for the maximum size of regeneration harvest units using the clearcut, seedtree, or the shelterwood cutting method. Monitoring indicates no deviations from the planned size limits except where catastrophic results of insect damage occurred. Where the catastrophic situations occurred, procedures to deviate from the prescribed cutting unit size-limits were followed, including interdisciplinary review and notification of the public.

Range Use (D-1): Range use, which is primarily cattle grazing, has been averaging less than the projected use but still remains within the variability limits stated in the Plan (90% versus 80%, respectively). Monitoring has disclosed some declining trends in range condition on some riparian areas in the northeast corner of the Forest.

Clearcut Acres Sold (E-9): This is a new monitoring item which tracks the amount of clearcut acres sold for harvesting on the Forest. The results indicate that the amount of clearcut acres sold has decreased since FY 1989, the baseline year for comparison.

Water Yield Increases (F-3): The Forest water yield model is used to analyze the potential effect of vegetative disturbance in a watershed before any timber sales are sold. About 46% of all the land within the National Forest drainage boundary has now been analyzed, and many of these watersheds included significant amounts of intermingled private land. (The watershed analysis includes both National Forest and private land.) Our current projection is that the total Forestwide average for areas that will exceed the water yield guidelines will be about 12-15% after all the watersheds have been

analyzed. Whenever the water yield guideline is exceeded in an area, planned activities on the National Forest lands have been deferred until watershed recovery occurs. This has been necessary to meet the Forest Plan standard and protect downstream beneficial uses as required by the Montana State water quality goals.

Insect and Disease Status as a Result of Activities (P-1): We've used aerial reconnaissance and individual timber stand analysis to determine the level of insect and disease organisms found in residual and surrounding timber. This analysis was done following management activities such as timber harvest, thinning, road construction, etc. Although a significant amount of acreage on the Forest is affected by insects and disease, no evidence suggests that any of the management activities are contributing to this situation. Rather, the activities have most often produced beneficial results in terms of managing forest health.

The monitoring items where we answered "NO we're out of compliance with the Forest Plan", or we're **OFF-TRACK** and moving away from that compliance, include: **Timber Sell Volume, Acres Sold for Timber Harvest, Suitable Timber Management Area Changes, Timber Harvest Deferrals, Soil and Water Conservation Practices, Forest Plan Costs**, and **Forest Plan Budget Levels**. Specifically, here's what we found for these items:

Timber Sell Volume (E-1): The Forest's allowable sale quantity (or projected upper limit) for the full decade of the plan on suitable lands is 2,270 MMBF. To reach this total in a steady fashion, the Forest's average annual programmed sell volume on suitable lands would be 227 MMBF per year for a 10-year period. For the first four years of implementation, the average annual sell volume has been 154 MMBF per year or 32% below projected levels. This deviation has been the result of clarifications in the management of grizzly bear habitat in the Cabinet-Yaak Ecosystem, deferrals to meet watershed standards in intermingled lands, and other reasons such as a court injunction against road construction and timber harvest in the upper Yaak River valley. The cumulative difference resulting from these factors totals 294 MMBF for the first four years of implementation. Trends appear to be in place which will not allow for this difference to be made up in the near future. At the current rate of separation between the average actual sell and the annual programmed sell, the Forest will have a cumulative difference of 730 MMBF at the end of the 10-year Plan period on September 30, 1997. An evaluation of this cumulative difference will be made after next year's monitoring is completed.

Acres Sold for Timber Harvest (E-2): The total acres sold for regeneration harvest is 38% below the planned level. This difference results from the same factors affecting timber sell volume and confirms the downward trend (see above).

Suitable Timber Management Area (MA) Changes (E-3): The Forest Plan allows for changes in the boundaries of management areas based upon site-specific analysis and interdisciplinary review. However, large changes could effect the ability of the Forest to produce particular outputs. After four years, the net loss in MA 15 (Timber Production) is 8,968 acres and beyond the Plan's 5,000-acre limit. The total net change of suitable timberland since October, 1987 has been a loss of 12,817 acres. This is 81% of the 15,740 regeneration harvest acres projected for sale each year. If this loss-trend continues at its current rate, about 32,042 acres of change could result by the end of the 10-year Plan period in September, 1997. This would be the equivalent of 2.5 years of projected timber sell acres or 25% of the total projected sell acres for the Plan period.

Timber Harvest Deferrals (E-7): Acres of suitable timber can be deferred from timber sales due to economics, resource conflicts or other unforeseen reasons. During the 4-year monitoring period, many different events or situations caused deferrals and one management area has changes large enough to initiate further evaluation (10,000 acres net change). The FY 1991 events and situations that deferred suitable timber acreage from sale proposals include timber sale scheduling adjustments to meet open-road density standards, necessary old-growth habitat replacement, poor timber sale cost-benefit conditions, and significant timber harvest on intermingled private land. This monitoring item will require adjustment at the time of Plan evaluation.

Soil and Water Conservation Practices (F-1): Monitoring of soil and water quality conservation practices showed that we did not fully meet our objective of 100% compliance with the State water quality guidelines. The use of best management practices (BMP's) is still relatively new for the Forest, and we're still learning how to apply and evaluate them to meet the State standards. Continued familiarity with BMP's and a better understanding of how certain practices affect water quality should raise the level of implementation success. It also may be unreasonable to have a 100% compliance level for any monitoring item. This does not allow for any amount of human error in a system that relies almost 100% on human effort. This 100% compliance level may need to be re-analyzed at the 5-year review point next year.

Forest Plan Costs (H-3): Here we evaluated whether the costs of producing Forest Plan outputs continue to be valid. Of the items evaluated, timber sale preparation costs have increased significantly. This is the result of the increasing complexity in timber sale preparation, along with the concurrent reduction in timber sell volume in FY 1991.

Forest Plan Budget Levels (H-4): For the last four years, the average Forest budget was less than stated in the Forest Plan (69% of planned level), but the trend is now moving toward that level. The lower average in the first two fiscal years (65%) was the result of budget trends that were in place prior to the approval of the Plan. Since the Plan was initiated, we've been working to achieve budgets that are in line with projections and are now closer to that goal (78% of planned level).

The monitoring items where we have **inadequate results** to support reasonable conclusions include: **Fisheries** (C-10), **Noxious Weed Infestations** (D-2) and **Stream Sedimentation** (F-2). These items were not monitored to a level sufficient to make firm determinations of whether or not they're within the Plan's variability limits, or moving toward or away from those limits.

The monitoring item that **doesn't fit** into any of the three previous categories was **Emerging Issues** (H-2). This item focuses on those issues that appear to be developing since the Plan was initiated, and also monitors the original Forest Plan issues that appear to be resisting a timely resolution. Emerging or potential issues identified include: air quality, biodiversity, impacts to Forest Service activities from adjacent private lands, noxious weeds, sensitive plants and animals, and wolf recovery. The Forest Plan issues that are resisting resolution are: grizzly bear management, state water quality standards, timber supply and volume, road management and access, snag habitat, and potential mineral development.

OBSERVATIONS OF SOME FORESTWIDE TRENDS

The results of the last four years of monitoring indicates that a definite trend is now in place. This trend is the cumulative reduced ability to provide the harvest opportunities that were estimated in the Forest Plan projections. We've quantified some components of this trend, and will continue to monitor them and others between now and the formal 5-year review. This 5-year review is scheduled to begin in October, 1992 when we'll make a determination of the significance of this changed situation. Below is a summary of the items which appear to be affecting the projected timber harvest levels.

Results of Formal Forest Plan Monitoring

To illustrate the trend of reduced outputs from the suitable timber management areas, please note the monitoring results for **Water Yield Increases** (F-3), **Timber Harvest Deferrals** (E-7), and **Suitable Timber Management Area Changes** (E-3).

Water Yield Increases: In watersheds containing both National Forest and private industrial forestland, accelerated private land timber harvest has brought many areas near or beyond threshold levels for water yield. This situation has resulted in reductions of harvests on Forest lands to avoid adverse

watershed effects. The estimated total land involved is over 356,000 acres. About 180,000 acres of National Forest land are affected, which includes about 100,000 acres of suitable timber. During development of the Forest Plan no allowance was made for such reductions in timber harvest on National Forest land in intermingled ownership.

Timber Harvest Deferrals: When timber sales are being planned, a site-specific analysis is done to determine how to best meet Forest Plan objectives. On occasion, not all objectives can be met, and as a result adjustments can result in a deferral of formerly planned harvest acres to some future time beyond the Forest Plan 10-year period. In addition to harvest acres deferred beyond the current Plan period to provide for watershed recovery, a number of deferrals have been made for unexpected conditions such as appeals and litigation. Others have been made because of poor cost-benefit situations. To date, over 17,000 acres have been deferred from timber harvest for these and other reasons.

Suitable Timber Management Area Changes: During site-specific timber sale project analysis, mapping errors are occasionally found concerning the exact location and on-the-ground situation of management areas. Most of these errors concern minor boundary changes, and are made and reported promptly to correct the conditions inaccurately portrayed on the Forest Plan map. Examples of these needed changes are: non-productive forest land found within productive forest areas; locations discovered with regeneration problems; and newly found stands of old-growth habitat. The result of all these boundary and resource situation changes made over the last four years is a net decrease of 12,817 acres in management areas suitable for timber harvest.

Other Informal Monitoring Results

The Forest conducts informal functional monitoring in addition to the formal process the Forest Plan prescribed. This has also revealed conditions indicating reduced outputs from management areas suitable for timber harvest. The primary resource areas noted are: **Grizzly Bear Habitat, Elk Security, Wildlife Snag Management,** and **Wildlife Hiding Cover**. In addition to these functional monitoring items, recent experience in a large portion of the Forest (the **Upper Yaak**) has helped to illustrate some of these cumulative resource effects.

Grizzly Bear Habitat: The Forest Plan provides for 1,035,000 acres of grizzly bear habitat. During the analysis for the Upper Yaak EIS, clarifications for grizzly bear habitat management brought 248,000 acres within the standards and guides for grizzly bear management. Of this, 143,000 acres were in suitable management areas which had been programmed for timber harvest at levels higher than acceptable for grizzly bear management.

Elk Security: The Forest Plan provides for elk management on about 1,300,000 acres of summer range. About half of this acreage (645,000 acres) is located within the suitable timber management areas. The Forest Plan assumed that adequate opportunity for elk security could be provided in all summer range areas. This assumption is proving true in most cases, but some areas are being discovered where elk security appears to be below a level which would meet Forest Plan goals for elk. Estimates indicate that about 84,000 acres of suitable timber in elk summer range might be involved.

Wildlife Snag Management. Because of previous timber harvest practices in many areas (primarily clearcutting in lodgepole pine timber or seedtree cutting and prompt overstory removal in mixed conifer timber), increased numbers of live, green leave trees are now required to meet standards for replacement snags for cavity nesters and small mammals. The increased number of leave trees was not anticipated in the yield calculations used to project the Forest harvest schedule. Although it has some effect on maximizing timber harvest on suitable management areas, the exact implications have not yet been defined.

Wildlife Hiding Cover: Recent experience indicates that regeneration harvest areas require 15-20 years to effectively provide wildlife hiding cover rather than the 10 years used for Forest Plan projections. As a result, harvest of mature timber adjacent to regeneration areas must occasionally be delayed 5-10 years until the newly-established vegetation becomes dense enough to provide acceptable hiding cover. This longer waiting period could possibly result in a lower harvest level over the long-term.

The Scope of Effects in both Formal and Informal Forest Monitoring

In total, a significant acreage of suitable management areas have been affected in the ways described above. About 550,000 acres are involved in timber harvest reductions and deferrals for a variety of reasons, including deferring harvest on intermingled Forest ownership, clarification in grizzly bear habitat management, elk summer range security needs, and others. Since there is overlap between some of these, and effects are not yet well quantified, it is estimated that as much as 360,000 acres have been affected in some fashion. This amounts to over one-quarter (28%) of the total suitable management areas on the Forest. Clearly, this is affecting the ability of the Forest to provide timber sell levels to eventually reach the Plan's allowable sale quantity. This is reflected in formal monitoring results which show 62% of planned regeneration harvest acres (-38%), and a 68% timber sell volume level (-32%) with indications that a continued decline, or at least a significantly reduced level, can be expected in the future (see **Acres Sold for Timber Harvest** (E-2) and **Timber Sell Volume** (E-1), respectively). At the 5-year review point, further analysis with additional monitoring information will show more detailed effects in terms of how these factors interact with achievement of the goals and objectives of the Plan. Programmed harvest is only one of the goals of the Plan, and all will be considered interactively at that time.

Summary of the Last Four Years of Forestwide Trends

The similarities between the results described above for the formal and informal Forest Plan monitoring and the results experienced in on-the-ground project implementation all seem to point in the same direction. That direction indicates that the effectiveness of the Forest's suitable timber base is being increasingly constrained by a variety of resource factors that are cumulative in nature. The net effect appears to be a reduced ability of the suitable timber management areas to provide the harvest opportunities that were estimated in the Forest Plan projections. The magnitude of this reduced effectiveness appears to be as much as 25-30%. Given the size of this difference, the Forest will continue to closely monitor this declining trend, and give strong consideration to recommending some significant changes to the Regional Forester at, or possibly before, the 5-year review.

WILDLIFE AND FISHERIES

Old-Growth Habitat: Monitoring Item C-5

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Maintain habitat capable of supporting viable populations of old-growth dependent species (10% old-growth in each drainage).
REPORTING FREQUENCY:	Every 2 years (1989, '91, '93, '95, '97)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Reduction below 10% in a drainage which was previously over minimum; or any reduction in a drainage previously under minimum.

Background: The Forest Plan designated and specified that at least 10% of the Forest land below 5,500 feet elevation would be protected as old-growth habitat for dependent wildlife species. This commitment amounts to a minimum of 186,500 acres and would ideally be equally distributed in all drainages on the Forest.

The current policy of old-growth habitat validation was implemented in a Kootenai Forest Manual Supplement (2400) issued in January, 1991. 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% level in each 3rd-order drainage or compartment. This validation process will provide for the protection of the best possible distribution of old-growth habitat. It also gives direction where 3rd-order drainages are found to have less than 10% old-growth habitat. In this case, part of the 10% acreage requirement can be provided with surplus (>10%) old-growth in an adjacent compartment to reach an average of 10% for both compartments. Another method to provide for a deficiency of old growth, if adjacent surplus old growth is not available, is to protect stands of mature timber that are not currently providing all the desirable attributes for high-quality old-growth habitat. 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. The important point is that the best possible distribution of old-growth habitat is to be provided wherever possible, and high-quality old-growth is to be the first priority for protection. These criteria could result in additional acreage being protected to achieve the desired distribution pattern. (See the Forest Plan Glossary and Appendix 17 of the Forest Plan for more detail on the description of old growth attributes including desired distribution patterns.)

Results: Table C-5-1 displays the results of the old-growth acreage compliance surveys for FY's 1990-91 plus the prior 2-year period. As can be seen, a significant increase in old-growth validation has occurred during the last two fiscal years. Forestwide, 581,960 acres have been surveyed and 68,480 acres are validated as protected old-growth habitat. Results indicate that 88% of this validated old-growth habitat contains all the desirable old-growth attributes which means it is in a fully effective condition (see Figure C-5-1). This also means that the remaining 12% are replacement stands because they don't contain all the desirable old-growth attributes at this time.

Evaluation: For the acres currently validated, about 11.8% are now protected which is above the 10% level required in the Plan. The reason for this higher level is the result of providing for an adequate distribution of biologically-effective old growth habitat. In addition, the percentage of fully effective old growth has been increasing steadily since validation began in FY 1988. One reason for the increasing rate of effectiveness is that much of the earlier validation work took place where fully effective old-growth habitat was lacking or

non-existent. These old-growth deficient areas were fire salvage harvest and lodgepole pine timber areas. As more habitat was evaluated in areas of the Forest more conducive to old-growth habitat (such as live, mixed-conifer timber) the relative amount of fully effective old-growth habitat increased.

After four years of old-growth habitat validation work, the Forest has completed 31% of the total acreage to be surveyed. In addition, about 192,000 acres are partially completed and much of this additional acreage will be reported in our FY 1992 report next year (see Figure C-5-2). Because of errors in the original Forest Plan old-growth mapping, and to meet the old growth distribution requirements stated above, additional stands were identified to meet the standard for 10% old growth. This has resulted in some necessary changes in some management areas. For more detail on changes to management areas, see Monitoring Item E-3.

Table C-5-1 Old-Growth Habitat and Condition Survey Results by Fiscal Year

Fiscal Years	Acres Surveyed	Acres Validated as Protected *Old-Growth* Habitat	Percent Validated as Protected *Old-Growth* Habitat	Old-Growth Habitat Acres Judged Fully Effective	Percent of Old-Growth Habitat Judged Fully *Effective*
1988-89[1]	94,210	12,530	13.3	8,450	67
1990	176,560	18,770	10.6	17,030	91
1991	311,190	37,180	11.9	34,760	94
Totals[2]	581,960	68,480	ave. 11.8	60,250	ave. 88

[1] The data submitted in the FY 1989 monitoring report contained errors which have been corrected in this report.
[2] Totals may not be exact because of rounding.

Figure C-5-1 Old Growth Habitat and Condition

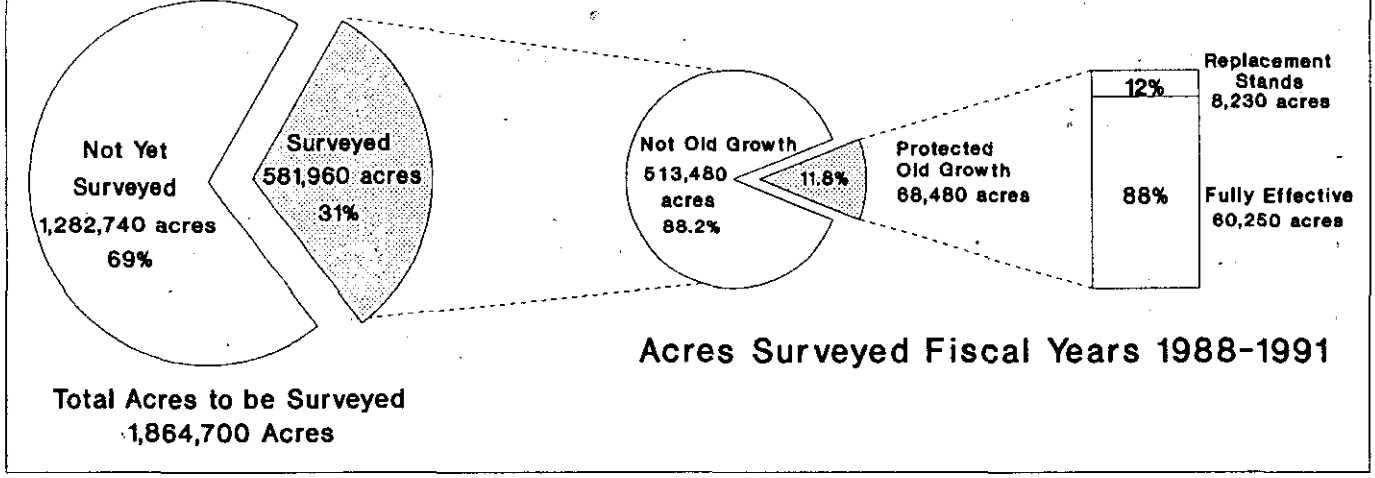
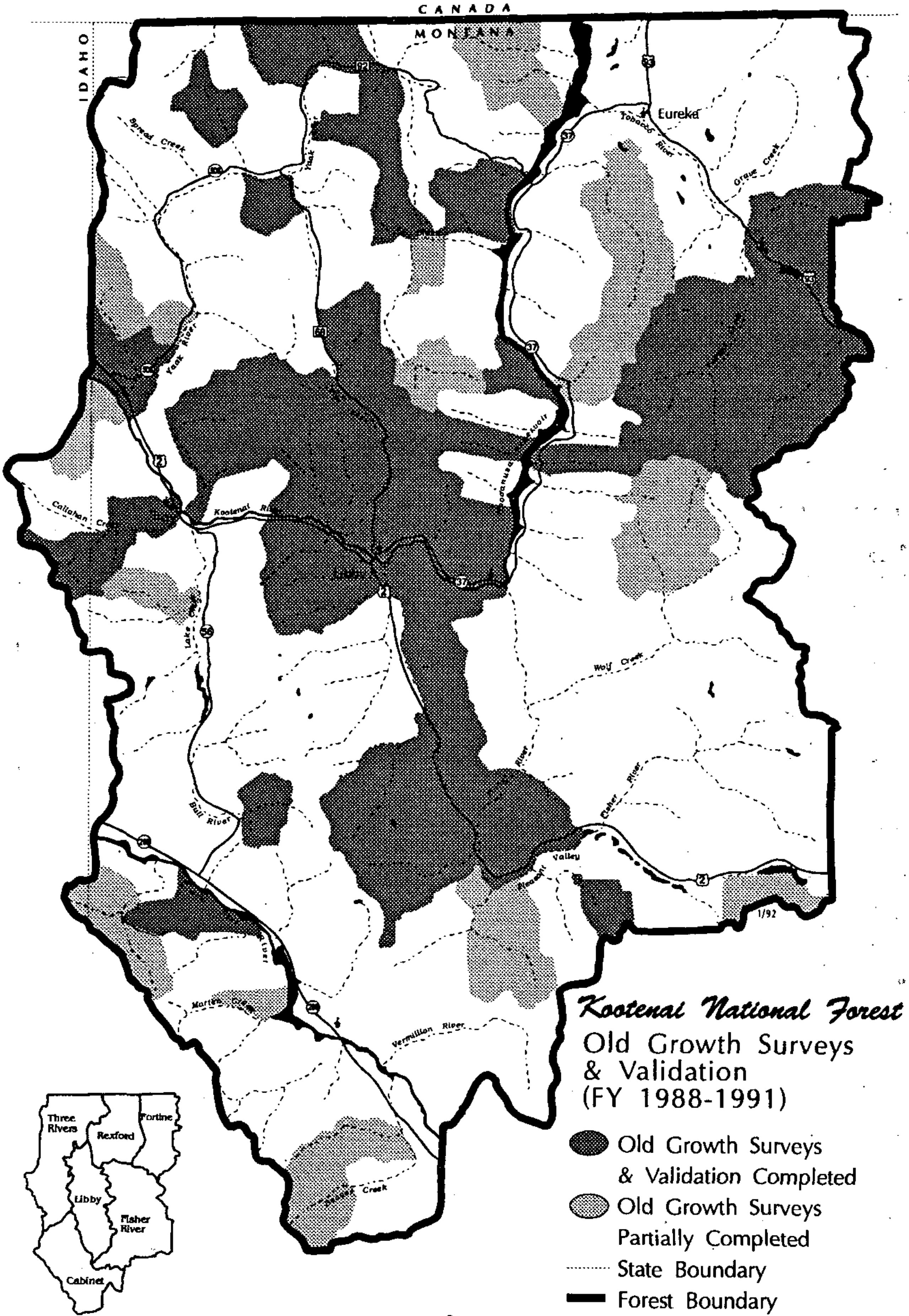


Figure C-5-2


CANADA
MONTANA
IDAHO
Eureka
Tobacco River
Grave Creek
Spread Creek
Yaak
Yaak River
Callahan Cr
Kootenai River
Libby
Koocanusa Reservoir
Lake Creek
Bull River
Wolf Creek
Fisher River
Pleasant Valley
Vermillion River
Marten Cr
Swamp Creek
1/92
Three Rivers
Rexford
Fortine
Libby
Fisher River
Cabinet
Kootenai National Forest
Old Growth Surveys
& Validation
(FY 1988-1991)
Old Growth Surveys
& Validation Completed
Old Growth Surveys
Partially Completed
State Boundary
Forest Boundary

T & E Species Habitat: Monitoring Item C-7

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Ensure adequate habitat is provided for recovery of T & E Species including: Peregrine Falcon, Gray Wolf, Bald Eagle and Grizzly Bear.
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Any downward population trend. Any forestwide decrease in habitat quantity or quality. Failure to meet recovery plan goals for the Kootenai N.F.

Results and Evaluation:

Peregrine Falcon: There are no specific recovery goals for the Forest, but the goal for Montana is 20 nesting pairs (USFWS, 1984). Currently there are 8 wild nesting pairs in the State which produced 11 young birds (personal communication with Dennis Flath, MT Dept. of Fish, Wildlife and Parks). Most of the birds currently nesting in Montana resulted from a hacking (re-introduction) program, but there has been no hacking program in northwest Montana.

There were no reported sightings of peregrine falcons on the Kootenai in fiscal year 1991. Only limited historical evidence exists of peregrines nesting on the Forest, and there is no known recent evidence of nesting. The few observations that have been made are probably limited to birds migrating between nesting and overwintering territories. The limited sightings could also be due to the lack of a systematic effort at obtaining sightings, such as the mid-winter bald eagle sighting effort. Some habitat potential exists on the Forest, but its occupation will probably require a hacking program, or waiting for a possible natural expansion from adjacent areas.

Gray Wolf: Guidance for the recovery of the gray wolf is derived from the Wolf Recovery Plan (USFWS, 1987), and there is one recovery area within or adjacent to the Kootenai Forest (the Northwest Montana Recovery Area). A small portion of this recovery area (about 10%) is located in the northeast corner of the Forest, east of U.S. Highway 93. (Wolf experts believe that there is additional habitat available adjacent to the existing defined recovery area.) The recovery goal is 10 breeding pairs (packs) for the entire recovery area. Five packs are confirmed to exist within and outside the recovery area, and are being monitored on a periodic basis. In addition, three un-confirmed packs are also being monitored (personal communication with Joe Fontaine, USFWS).

Habitat conditions are considered good in the Kootenai Forest portion of the Northwest Montana Recovery Area. This is because hiding cover is abundant and well dispersed, and road access management provides adequate security. Available prey (big game) is abundant which provides the necessary food source, and man's activity levels are low to moderate thereby reducing the risk of human-wolf conflicts. Because of these desirable habitat conditions, the gray wolf population should have every opportunity to increase within the Kootenai Forest portion of the recovery area.

At this time, one confirmed pack of 5-10 animals is being monitored within the Kootenai Forest portion of the recovery area. This pack contains two radio-collared wolves. Additional wolf sightings have been reported on a fairly regular basis near Eureka, in the Yaak River area, and in the Wolf Creek-Pleasant Valley area. Pack

formation may be occurring in these three additional areas, and they will be monitored in coordination with the USFWS.

Bald Eagle: Guidance for bald eagle recovery comes from the Montana Bald Eagle Management Plan (MBEWG, 1986) and the Pacific States Bald Eagle Recovery Plan (USFWS, 1982). These plans call for the establishment of 52 nesting pairs within Recovery Zone 7, which is the Montana section of the upper Columbia River Basin. This recovery zone includes all public and private land west of the continental divide in Montana, and the Kootenai Forest area is about 15% of the zone. As of FY 1991, 63 nesting pairs existed in Recovery Zone 7, of which 55 nesting pairs successfully fledged 94 young eagles (personal communication with Dennis Flath, MT Dept. of Fish, Wildlife and Parks). This would indicate that the bald eagle could be considered for downlisting in the near future.

Most of the Kootenai Forest's effort in bald eagle recovery centers on coordination to integrate bald eagle needs with other land management activities such as recreation, wildlife habitat improvement, land exchanges, minerals development, and timber harvesting. The Forest also participates in the mid-winter surveys and monitors the success of the spring/summer nesting season. Table C-7-1 shows the results of mid-winter bald eagle survey on the Forest which occurs mostly along major watercourses. In FY 1991, a total of 103 bald eagles were counted (89 mature and 14 immature). This matches the previous all-time high count in FY 1989. In addition, 16 active nests with a total of 22 fledged young were monitored in FY 1991. This is an increase over FY 1990 and a new all-time high count. It is also 23% of the total successful fledglings in Recovery Zone 7 in FY 1991. The primary bald eagle survey and monitoring areas are: Kootenai, Clark Fork, and Fisher Rivers; Wolf Creek; and the Koocanusa, Noxon and Cabinet Gorge Reservoirs.

Grizzly Bear: Recovery goals are based on the Grizzly Bear Recovery Plan (USFWS, 1982). The Kootenai Forest contains portions of two grizzly bear recovery areas; the Cabinet-Yaak Ecosystem (CYE) and the Northern Continental Divide Ecosystem (NCDE). About 72% of the CYE is located on the western portion of the Forest, and about 10% of the NCDE is located in the extreme northeast corner (see Figure C-7-3). Each of these ecosystems are further sub-divided into smaller areas for analysis and monitoring, and are known as grizzly bear management units (GBMU's). The Forest's primary effort in grizzly bear recovery is in habitat management, co-operating in grizzly bear studies within the Yaak River area, and assisting with bear augmentation tests in the Cabinet Mountain Wilderness.

Table C-7-2 shows habitat effectiveness values for each of the GBMU's evaluated during fiscal years 1988-91. Effectiveness is based on the percent of habitat available to bears, and the desired level is 70% or greater. In fiscal year 1991, ten GBMU's are at, or above, the desired 70% level which is the same status as the previous year. Of the eight GBMU's that are still below the desired 70% level, all of them are still improving or maintaining in habitat effectiveness. This steady improvement can be seen in the Forestwide average which is now above the desired 70% level. As the Forest's habitat management program continues, the eight below-standard GBMU's are expected to continue to improve and eventually reach the desired level of effectiveness.

Un-duplicated sightings of females with young cubs are considered to be important indicators of potential population growth. In FY 1991, there were four confirmed, un-duplicated sightings of female grizzly bears with young cubs in the NCDE. There was one confirmed un-duplicated sighting of a female grizzly with a young cub on the remainder of the Forest which encompasses the CYE.

Mortality rates are another key indicator of potential population trends. In 1991, one known mortality was discovered in the CYE. No known mortalities occurred in the KNF portion of the NCDE.

Summary: The wolf, bald eagle and grizzly bear have had increased sightings during the last four years. All of the T & E habitats being monitored appear to be improving or at least maintaining. The indications at this time are that the Kootenai Forest is progressing well toward meeting recovery plan goals.

Table C-7-1 Mid-Winter Bald Eagle Survey Count and Spring Nesting Results by Fiscal Year

Fiscal Year	Mature Eagles	Immature Eagles	Total Eagles	Active Nests	Fledglings
1988	65	12	77	3	6
1989	68	35	103	6	9
1990	65	21	86	12	17
1991	89	14	103	16	22
Average*	72	21	92	9	14

* Averages are rounded off.

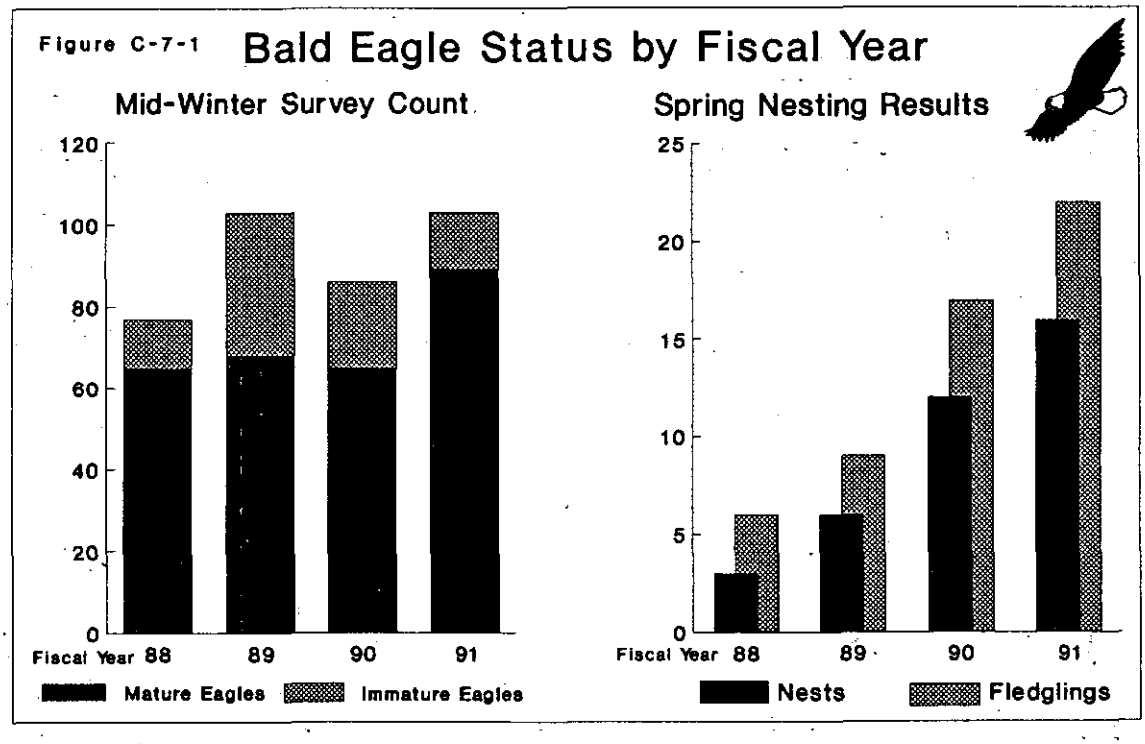


Table C-7-2 Grizzly Bear Habitat Effectiveness (%) by Fiscal Year (FY)

Grizzly Bear Management Unit	FY 1988	FY 1989	FY 1990	FY 1991
Above 70 percent:				
#1 Murphy Lake[1]	78	79	78	78
#1 Cedar	81	81	81	82
#2 Snowshoe	82	82	82	81
#3 Spar	70	71	70	70
#4 Bull	80	78	80	80
#5 Saint Paul	73	77	79	80
#6 Wanless	74	74	72	74
#7 Silver Butte-Fisher	87	87	87	87
#8 Vermillion	79	80	80	73[2]
#13 Keno	68	68	72	72
Below 70 percent:				
#9 Callahan	64	55	62	67
#10 Pulpit	43	47	50	56
#11 Roderick	60	59	66	68
#12 Newton	42	42	43	53
#14 Northwest Peak	61	61	68	68
#15 Garver	50	47	62	62
#16 East Fork Yaak	47	46	59	61
#17 Big Creek	51	58	58	63
Forestwide Average	66	66	69	71

[1] GBMU #1 - Murphy Lake, is located in the North Continental Divide Ecosystem. All other GBMU's are in the Cabinet Yaak Ecosystem.
[2] GBMU #8 - Vermilion, was re-calculated and determined to have a lower rating, even though nothing has changed on-the-ground.

Figure C-7-2 Grizzly Bear Habitat Effectiveness

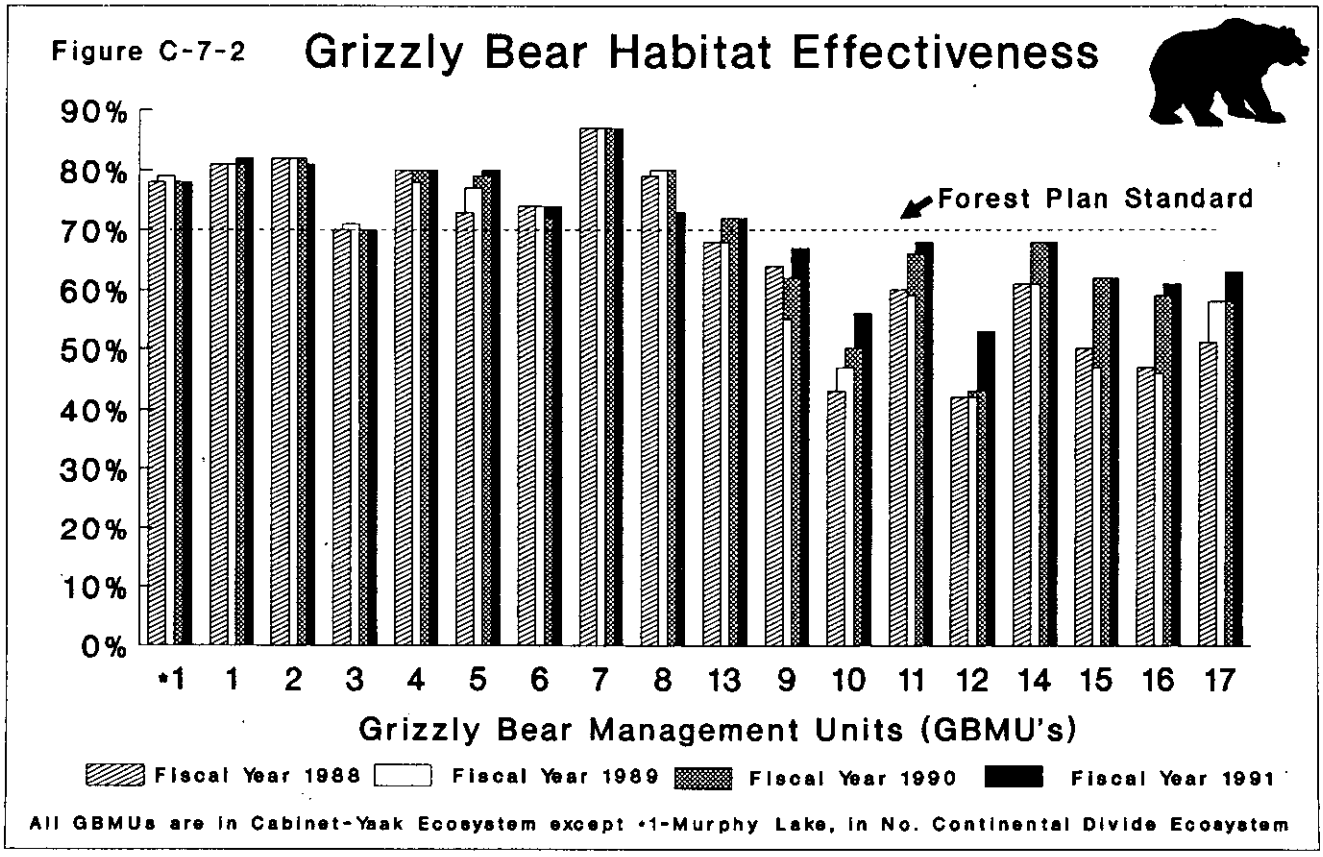
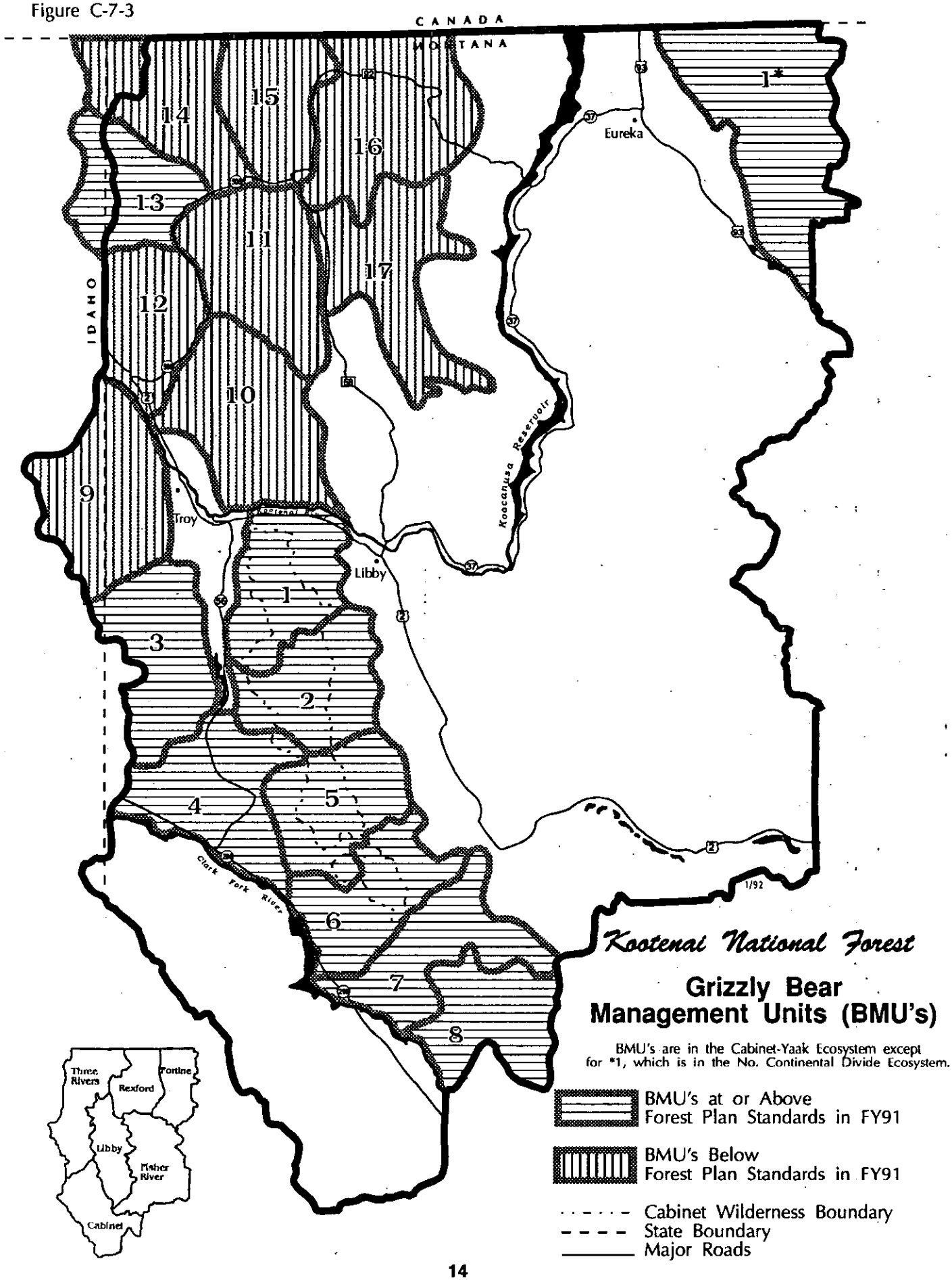


Figure C-7-3


CANADA
MONTANA
IDAHO
Eureka
Troy
Libby
Kootenai
Koocanusa Reservoir
Clark Fork River
1*
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
1/92
Kootenai National Forest
Grizzly Bear Management Units (BMU's)
BMU's are in the Cabinet-Yaak Ecosystem except for *1, which is in the No. Continental Divide Ecosystem.
BMU's at or Above Forest Plan Standards in FY91
BMU's Below Forest Plan Standards in FY91
Cabinet Wilderness Boundary
State Boundary
Major Roads
Three Rivers
Rexford
Fortine
Libby
Fisher River
Cabinet

WILDLIFE AND FISHERIES

Fisheries Habitat: Monitoring Item C-10

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine changes in fish habitat and populations.
REPORTING FREQUENCY:	Every 2 years (1989, '91, '93, '95, '97)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 10% change in Redd's, +/- 2 degrees change in stream temperature, +/- 10% change in sediment, +/- 10% change in embeddedness, +/- 20% change in debris accumulations.

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 aggressive 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 Appendixes 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 Forest management.

Six monitoring tasks (on seven representative watersheds) were designated under this element (surveys, streambed cores, temperature, woody debris analysis, redd counts, and embeddedness sampling) to assess the effects on fish and fish habitat. See Monitoring Item F-2 for the list of representative watersheds where these monitoring tasks are being conducted.

The limited availability of fisheries biologists on the Forest has been primarily directed at the survey and evaluation of five of the six sensitive fish species known to occur on the Forest (bull trout, interior redband trout, westslope cutthroat trout, torrent sculpin and shorthead sculpin). The other sensitive species, sturgeon, is being surveyed and evaluated by the Montana Department of Fish, Wildlife and Parks.

Results: To date, no conclusive data is available to report on fish habitat and populations in the representative watersheds. Fish habitat improvements are being done as scheduled in the Forest Plan (see Appendix A at the end of this report).

During FY 1990-91, over 75 small watersheds were surveyed for the presence of sensitive fish species. This survey work focused on all the sensitive fish species except sturgeon which the States of Montana and Idaho are doing research on. To date, 24 watersheds have been designated as containing sensitive fish populations. Based on the survey evidence, about 850 miles of fish streams may eventually be identified as containing sensitive fish. This could be about 25% of the total occupied fish habitat on the Forest.

RANGE

Range Use: Monitoring Item D-1

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine if the permitted grazing use measured in Animal Unit Months (AUM's) meets Forest Plan projections.
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 20% of anticipated AUM's.

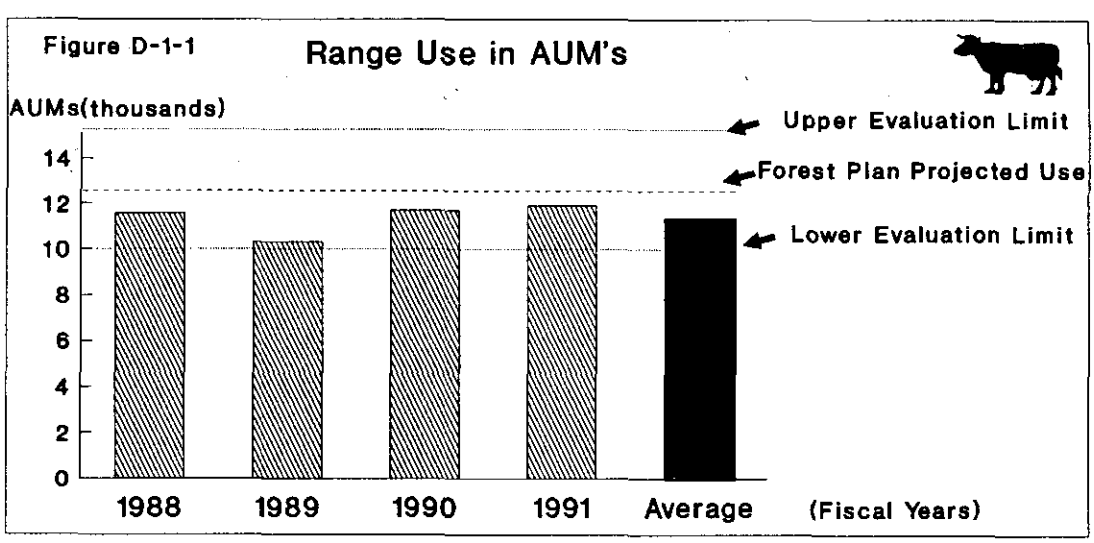
Background: The projected availability of forage for livestock grazing, measured in AUM's is 12,600. This activity is concentrated primarily in the northeastern portion of the Forest on the Rexford and Fortine Ranger Districts.

Results: During the last four years, actual use has been less than projected but not to the extent which would initiate further evaluation. This lower use is mostly from permittee requests for non-use. Some of the non-use is from Forest requests to defer grazing to prevent resource damage, such as the trampling or grazing of small tree seedlings after timber harvest.

Evaluation: Some downward-trending range conditions have been reported on the Fortine Ranger District. Some of this is the result of effects in riparian areas which is a Forestwide concern. Some conflicts with grazing are emerging within some intermingled private land areas that are being subdivided and developed for rural residential use.

Table D-1-1 Range Use by Fiscal Year (FY)

Item	Forest Plan Projected Use	FY 1988	FY 1989	FY 1990	FY 1991	Average
AUM's	12,600	11,600	10,300	11,700	11,900	11,400
Percent	100	92	82	93	94	90



RANGE

Noxious Weed Infestations: Monitoring Item D-2

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine acreage infested with noxious weeds.
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	10% increase in number of acres infested, density of existing infestations and a change in the diversity of noxious weed species.

Background: Forest Plan requirements state 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. Currently, there is no completed baseline inventory available for noxious weed infestations. Spotted knapweed is the primary noxious weed specie found on the Forest. It occurs primarily along roadsides and powerline rights-of way. It has also been noticed on trails on the east side of the Forest at the lower elevations, particularly in cutover areas.

Results: During FY 1991, baseline mapping was initiated on several Districts in co-operation with the Lincoln County Weed and Rodent Board. Also, the eradication of spotted knapweed, dalmation toadflax and leafy spurge occurred at several locations using various methods such as spraying and hand-pulling.

During FY 1991, the Forest and Champion International contributed funding to establish two more biological control agents. One was a knapweed root weevil and one was a knapweed seedhead moth. The root weevil eats on the root of the spotted knapweed while the moth eats on the seedhead. These releases were done on a powerline right-of-way near Stryker, Montana. Previously, co-operative research funding resulted in the establishment of two other biological control agents on spotted knapweed. They are two different specie of knapweed seedhead fly which also eat on the seedhead of the spotted knapweed plants. All of this research work is in coordination with the Western Agricultural Research Station and the Lincoln County Weed and Rodent Board. The researchers anticipate that these insects can become established in areas where knapweed is a problem and become an effective natural (biological) control. These sites will continue to be monitored to determine the success of this project.

TIMBER

Timber Sell Volume: Monitoring Item E-1

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine if the annual timber sell volume meets the projections of the Forest Plan (allowable sale quantity plus other permissible sale volumes).
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 5% deviation after 5 years for the suitable timber sell volume, and +/- 10% deviation after 5 years for the unsuitable volume.

Background: The Forest's projected total maximum timber sell volume from suitable management areas is 2,270 million board feet (MMBF) for the decade which is an average of 227 MMBF per year (see Forest Plan, Appendix 11). This volume is known as the allowable sale quantity (ASQ). In addition, 60 MMBF is estimated to be sold from unsuitable management areas, averaging 6 MMBF per year. These two components of suitable and unsuitable sell volumes comprise the total potential timber sale program of 2,330 MMBF for the decade which is an average of 233 MMBF per year.

In addition to monitoring the total suitable timber sell volume on the Forest, the Regional Forester has requested that other components of the suitable sell volume also be monitored. Some of these other components are: timber sell volume within inventoried roadless areas, sell volume within T & E habitat (grizzly bear), and sell volume adjacent to private timberlands. These other components were requested to better define what portions of the suitable base are on-track with the Forest Plan projections. This additional information should help provide a clearer picture of what changes may be needed at the 5-year review and evaluation. This year's report has been expanded to provide timber sell information for inventoried roadless areas and for grizzly bear habitat.

The majority (98%) of the suitable timber sell volume is projected to occur on lands not inventoried as roadless areas (2,234 MMBF) with the remainder (2%) to occur within inventoried roadless areas (36 MMBF). These two components would average 223.4 MMBF per year and 3.6 MMBF per year, respectively. Also, about one-third (34%) of the suitable timber sell volume is projected to occur on lands within identified grizzly bear habitat (770 MMBF) with the remainder (66%) occurring on lands identified as not needed for grizzly bear recovery (1,500 MMBF). These two components would average 77 MMBF per year and 150 MMBF per year, respectively.

Results: The timber sell volume on suitable lands for FY 1991 is 114 MMBF, the lowest level of the last four years and 50% of the projected maximum amount (see Table E-1-1). The reason for this low sell level is the large amount of volume (51 MMBF) advertised at the end of FY 1991 and sold in the beginning of FY 1992. (This 51 MMBF will be accounted for in next year's FY 1992 Monitoring Report.)

Total Suitable Lands: Total timber sell volume for the first four years is 614 MMBF. This is 294 MMBF less than the ASQ (see Table E-1-1).

Within Inventoried Roadless Areas: Total timber volume sold after four years is 15 MMBF which is close to the 14 MMBF projected in the Forest Plan (see Table E-1-2).

Within Grizzly Bear Habitat: Total timber volume sold after four years is 129 MMBF. This is 179 MMBF less than the Forest Plan projection (see Table E-1-3).

Evaluation: Table E-1-1 indicates that the average annual timber sell volume from total suitable lands is at the 68% achievement level and outside the 95% level prescribed in the Plan. The average annual timber sell from inventoried roadless areas is close to the projected volume, and the difference is considered reasonable for the small annual volume (see Table E-1-2). The average annual timber sell volume from grizzly bear habitat indicates the lowest achievement (42%) of all the suitable timber components monitored to-date. This component is considered to be off-track with the Forest Plan projection, especially compared to the average annual achievement of 81% on non-grizzly habitat (see Table E-1-3).

It's important to remember that grizzly bear habitat management includes a variety of resources in addition to grizzly bears. This is because the grizzly habitat includes over 1,035,000 acres which is 46% of the total Forest (see Figure C-7-3). Because of this large area, other factors besides grizzly bear management are affecting the timber sell program and some of them are displayed elsewhere in this report. These other factors will be analyzed in more detail in the upcoming 5-year review to display their proportionate effect on the timber sell program. Some of these other factors are:

A Ninth Circuit Court injunction on timber sales and road construction in the Upper Yaak River. This resulted in the deferral of 59 MMBF of timber sales scheduled for FY 1988 and 39 MMBF for FY 89. If these sales had not been judicially deferred, the timber sell volume in grizzly bear habitat for FY's 1988-89 would have met or exceeded the projected levels (see Table E-1-3). Other litigation and appeals have delayed the sale of 23 MMBF since FY 1988.

The new Region-1 timber utilization standards were not implemented in FY 1988 when the Forest Plan period began. The Forest Plan used these new standards in its planned harvest estimates, but they were not actually used on-the-ground to prepare and sell timber sales until FY 1990. The use of these new standards reflect manufactured yields of wood products using more current mill technology, and would have resulted in an estimated 20 MMBF more volume forestwide for FY 1988-89.

Because of previous timber harvest practices in many areas (primarily clearcutting in lodgepole pine timber, or seedtree cutting and prompt overstory removal in mixed conifer timber) increased numbers of green leave trees are now required for replacement snags for birds and small mammals. In many cases, previously planned overstory removal harvests are now deferred permanently to meet Forest Plan snag management standards.

Experience indicates that wildlife hiding cover is taking longer to become effective after regeneration harvesting compared to the Forest Plan estimates (15-20 years versus 10 years). This has delayed some harvest units beyond the end of the Forest Plan period (FY 1997). (See Timber Harvest Deferrals (E-7.)

Experience has revealed mapping errors that resulted in shortages of the required amount of old growth habitat needed to meet Forest Plan standards. When a shortage is discovered, additional old growth habitat must be identified to bring the area total up to the required 10% before any projects can be completed. The additional old growth comes from the unsuitable management areas (if available) but if not available, must come from the suitable management areas. Sometimes these additional timber stands in the suitable timber base were previously scheduled for timber harvest during the Plan period, but were redesignated to old growth habitat protection. For more information on these items see Suitable Timber Management Area Changes (E-3) and Timber Harvest Deferrals (E-7). Also see Old-Growth Habitat (C-5) for more detail on the old growth validation process.

Clarifications in the management of grizzly bear habitat as a result of periodic formal and informal consultation with the U.S. Fish and Wildlife Service, primarily in the upper Yaak River portion of the Cabinet-Yaak Ecosystem. These consultations have resulted in the identification of 248,000 acres of grizzly bear management areas. The effects have been access restrictions on 143,000 acres of

suitable timber and a change in timber sale opportunities compared to those projected in the original Forest Plan assumptions.

Higher than expected timber harvesting on intermingled private lands. This resulted in delays of Kootenai Forest timber sales because of hydrologic concerns (see Water Yield Increases (F-3) and Timber Harvest Deferrals (E-7). Additional analysis is currently underway to quantify the magnitude of this situation. Most of this area is outside of identified grizzly bear habitat.

For more detailed volume information concerning the timber sell program, see Appendix B.

Table E-1-1 Timber Sell Volumes (MMBF) by Land Classification by Fiscal Year (FY)*

Forest Land Classification	Annual Forest Plan Projection	FY 1988	FY 1989	FY 1990	FY 1991	Total 4-Year Timber Sell 1988-91	Average Timber Sell per FY	Percent of Annual Forest Plan Projection	4-Year Forest Plan Projected Sell	Difference From Forest Plan Projection
Suitable Lands	227	173	181	146	114	614	154	68	908	-294
Unsuitable Lands	6	2	4	2	6	14	4	67	24	-10
Total Timber Sell Program	233	175	185	148	120	628	157	67	932	-304

* Some totals may not be exact because of rounding.

Figure E-1-1

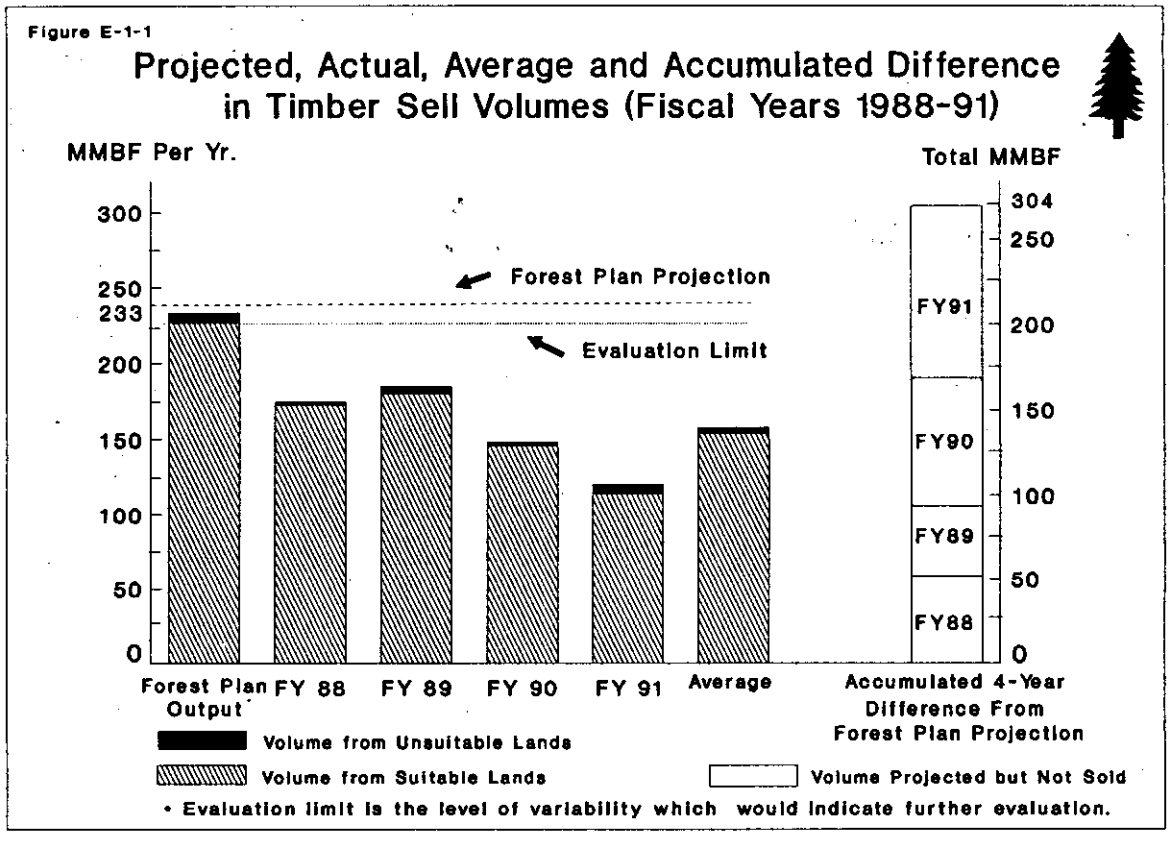
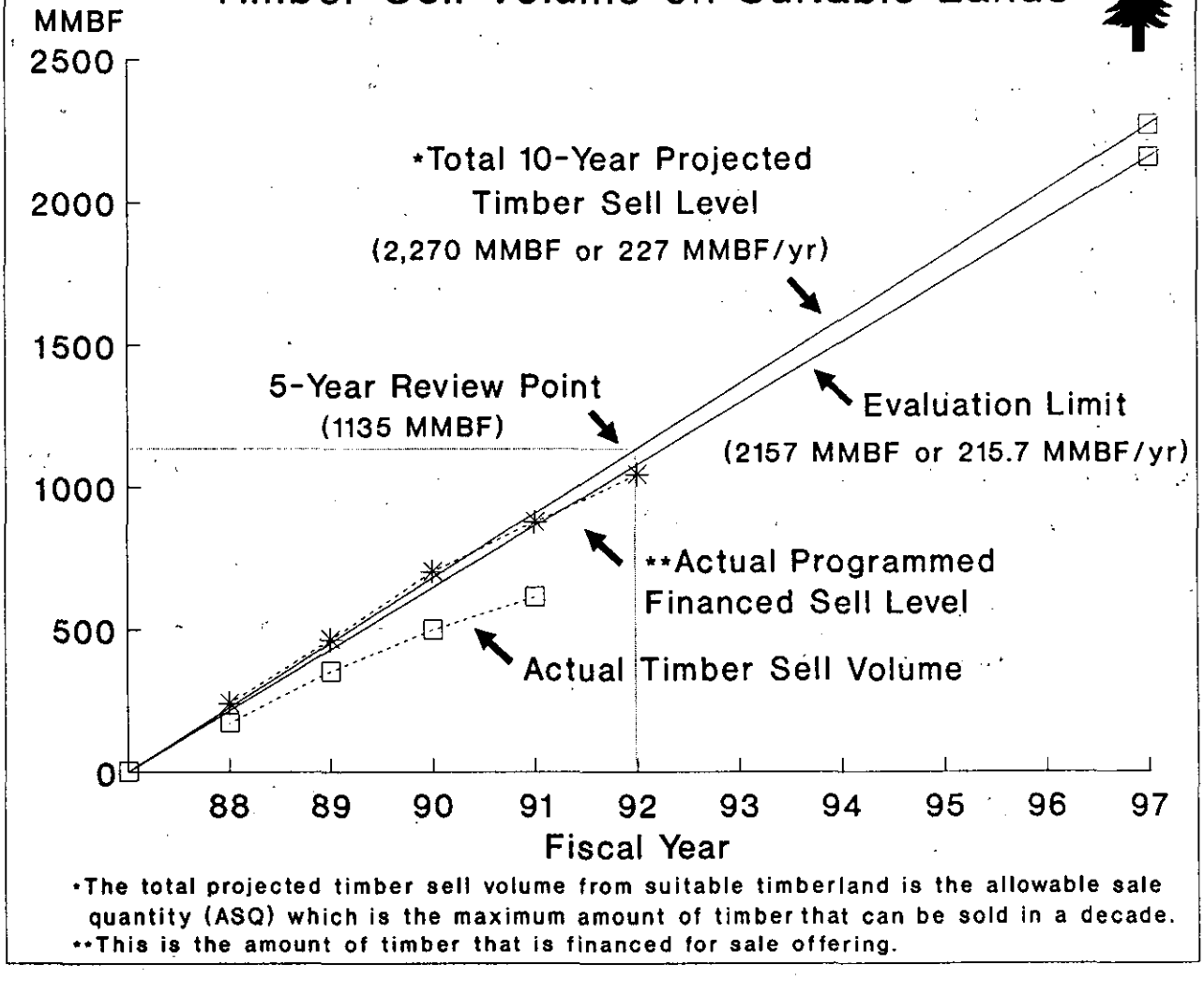


Figure E-1-1a

Projected and Actual Accumulative Timber Sell Volume on Suitable Lands



*The total projected timber sell volume from suitable timberland is the allowable sale quantity (ASQ) which is the maximum amount of timber that can be sold in a decade.

**This is the amount of timber that is financed for sale offering.

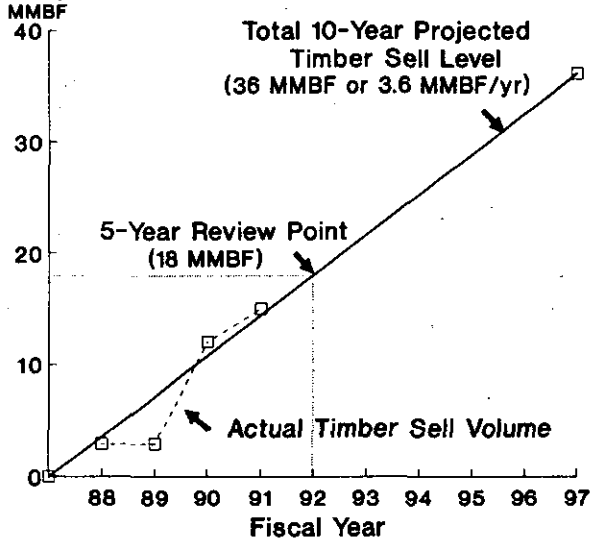
Table E-1-2 Timber Sell Volumes (MMBF) by Land Category by Fiscal Year (FY)*

Forest Land Category	Annual Forest Plan Projection	FY 1988	FY 1989	FY 1990	FY 1991	Total 4-Year Timber Sell 1988-91	Average Timber Sell per FY	Percent of Annual Forest Plan Projection	4-Year Forest Plan Projected Sell	Difference From Forest Plan Projection
Inventoried Roadless Lands	3.6	3	0	9	4	15	4	111	14	+1
Not Inventoried as Roadless	223.4	170	181	137	110	598	150	67	894	-296
Total Sell, Suitable Lands	227.0	173	181	146	114	614	154	68	908	-294

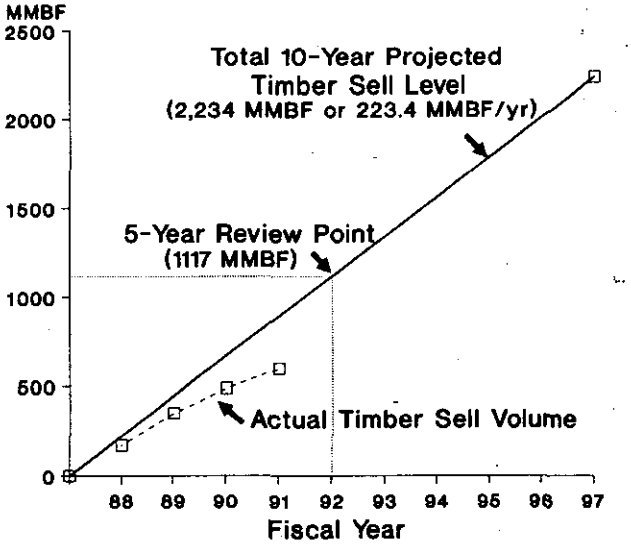
* Some totals may not be exact because of rounding.

Figure E-1-2

Projected and Actual Accumulative Timber Sell Volume By Land Category (FY 1988-91, MMBF)



Inside Inventoried Roadless Areas



Outside Inventoried Roadless Areas

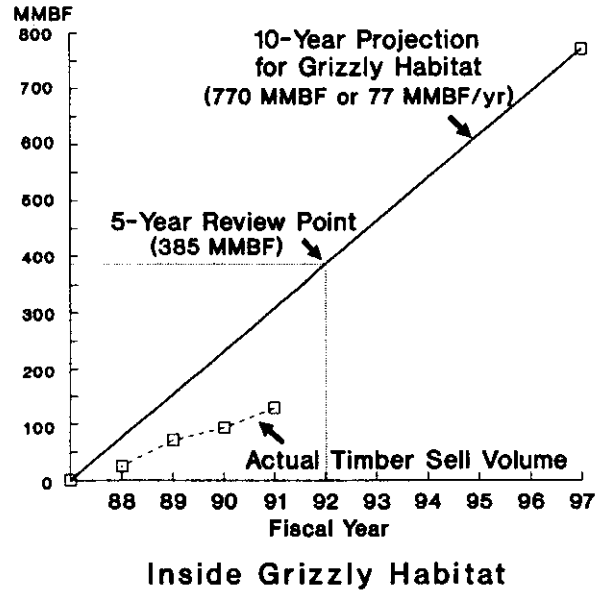
Table E-1-3 Timber Sell Volumes (MMBF) by T & E Species Habitat by Fiscal Year (FY)*

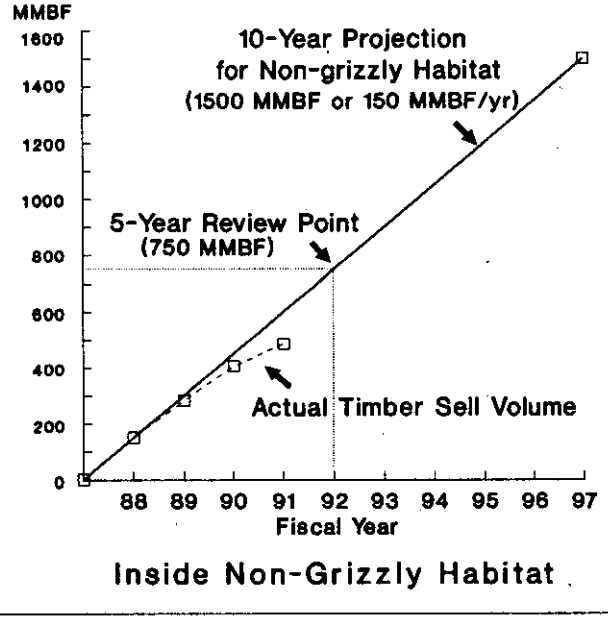
T & E Species Habitat	Annual Forest Plan Projection	FY 1988	FY 1989	FY 1990	FY 1991	Total 4-Year Timber Sell 1988-91	Average Timber Sell per FY	Percent of Annual Forest Plan Projection	4-Year Forest Plan Projected Sell	Difference From Forest Plan Projection
Grizzly Bear Habitat	77	24	47	22	36	129	32	42	308	-179[1]
Non-grizzly Habitat	150	149	134	124	78	485	121	81	600	-115
Total Sell, Suitable Lands	227	173	181	146	114	614	154	68	908	-294

* Some totals may not be exact because of rounding.

Figure E-1-3

Projected and Actual Accumulative Timber Sell Volume on Suitable Lands by T & E Species Habitat (FY 1988-91, MMBF)





[1] If the timber sales planned in the Upper Yaak River area had not been judicially deferred, the timber sell volumes in grizzly bear habitat for FY's 1988-89 would have met or exceeded the projected levels.

TIMBER

Acres Sold for Timber Harvest: Monitoring Item E-2

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine if the regeneration harvest acres meet Forest Plan projections by management area.
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 10% by management area after 5 years.

Background: The Forest Plan projects 15,740 acres of annual regeneration harvests to achieve the allowable sale quantity (ASQ). Regeneration harvests include clearcut, seedtree, and shelterwood cutting methods.

The acres to be harvested to meet the ASQ are located in six different management areas (MA's). 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, or budget requirements. (For more information on the Forest Plan MA requirements, see Chapters II and III of the Forest Plan.)

Results: Table E-2-1 shows the acres sold for timber harvest by management area by fiscal year plus a 4-year average, and compares that average to the Forest Plan projection. The average acreage sold in MA 15 is 72% above the projected level, while four other suitable timber MA's are significantly below the Forest Plan projected level (MA's 12, 14, 16, 17). MA 12 has the largest average acreage deviation (4,403 acres).

(Note that the total for FY 1991 is also shown and compared to the Forest Plan totals as well as the previous three fiscal years. As can be seen, the FY 1991 totals are the lowest of the four years shown and correspond closely with the timber volume sold and trends shown in Monitoring Item E-1.)

Evaluation: MA 15 is primarily oriented to timber production and has less conflict with other resources such as big game, visual quality, Threatened and Endangered (T & E) species, etc. Because of the Forest goal to harvest as much dead and dying lodgepole pine as quickly as possible, timber sales have been emphasized in MA 15. This MA also contains an extensive road network which allows quick access to the insect-infested timber. This combination of existing access and low resource conflict has allowed the most efficient response to the infestation to maximize the timber salvage volumes (see Budget Levels, H-4). It is expected that the high level of timber sales prepared to harvest lodgepole pine beetle-killed timber will continue for several years even though the Mountain Pine Beetle (MPB) infestation is declining (see Monitoring Item P-1). This is because the amount of acreage attacked each year by the MPB is still significant (about 46,000 acres in 1991).

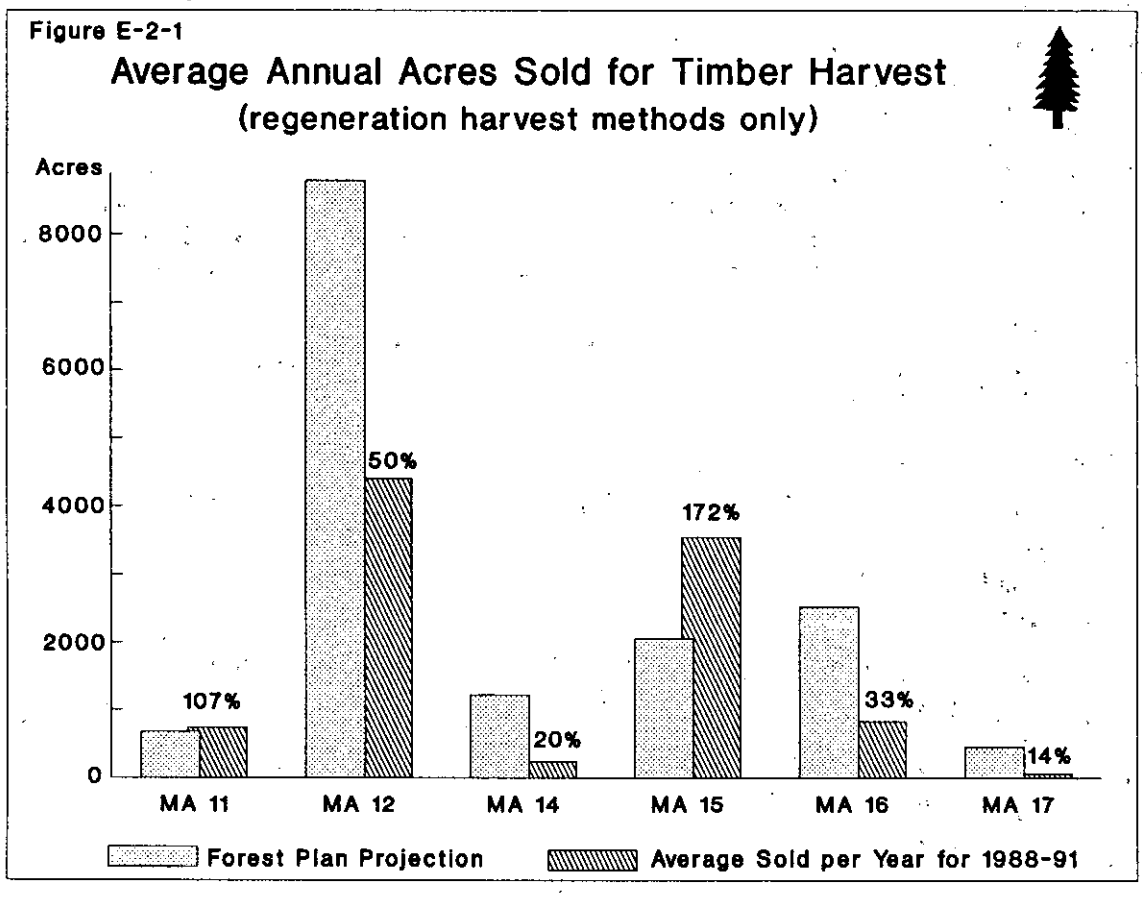
The large acreage deviation in MA-12 (over 4,400 acres per year) is because of a combination of several factors. They are the evolving interpretations of Forest Plan standards for grizzly bear management, open-road densities for big game, hiding cover is taking longer to become effective, and providing for a 10% minimum amount of old growth habitat. See Monitoring Item E-7 for more information.

Table E-2-1 Acres Sold for Timber Harvest by Fiscal Year (FY)*

Management Areas (MA's)	Forest Plan Projected Acres	FY 1988	FY 1989	FY 1990	FY 1991	Average Sold per Year	Percent of Forest Plan Projection
11	690	696	665	831	772	741	107
12	8,800	6,518	5,431	3,729	1,911	4,397	50
14	1,220	170	139	142	535	247	20
15	2,050	3,513	4,574	3,790	2,258	3,533	172
16	2,520	325	416	277	2,294	828	33
17	460	55	10	47	137	62	14
Total	15,740	11,277	11,235	8,809	7,907	9,807	62

* Regeneration Harvest Methods Only

Figure E-2-1



Suitable Timber Management Area Changes: Monitoring Item E-3

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine if significant cumulative changes are occurring in suitable timber base by tracking management area boundary changes.
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 5,000 acre cumulative total change in any suitable timber management area after 5 years.

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 management areas (MA's) 11, 12, 14-17. These MA's are validated during site-specific project analysis. When errors are found, a 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 a MA map change are: mapping and drafting errors found on the original maps; non-productive forest land located within a MA that is mapped as productive (the reverse situation is also found); big-game winter range habitat non-existing where originally mapped (the reverse is also found); grizzly bear habitat existing where previously unmapped; the absence of old-growth timber habitat and the need to designate additional acreage to meet the 10% minimum standard.

Results: Table E-3-1 displays the net MA acreage changes for fiscal years 1988-91 and the net change in the suitable timber base. Total net losses in the suitable timber base in FY 1991 are almost 6,300 acres which is a 33% increase over FY 1990.

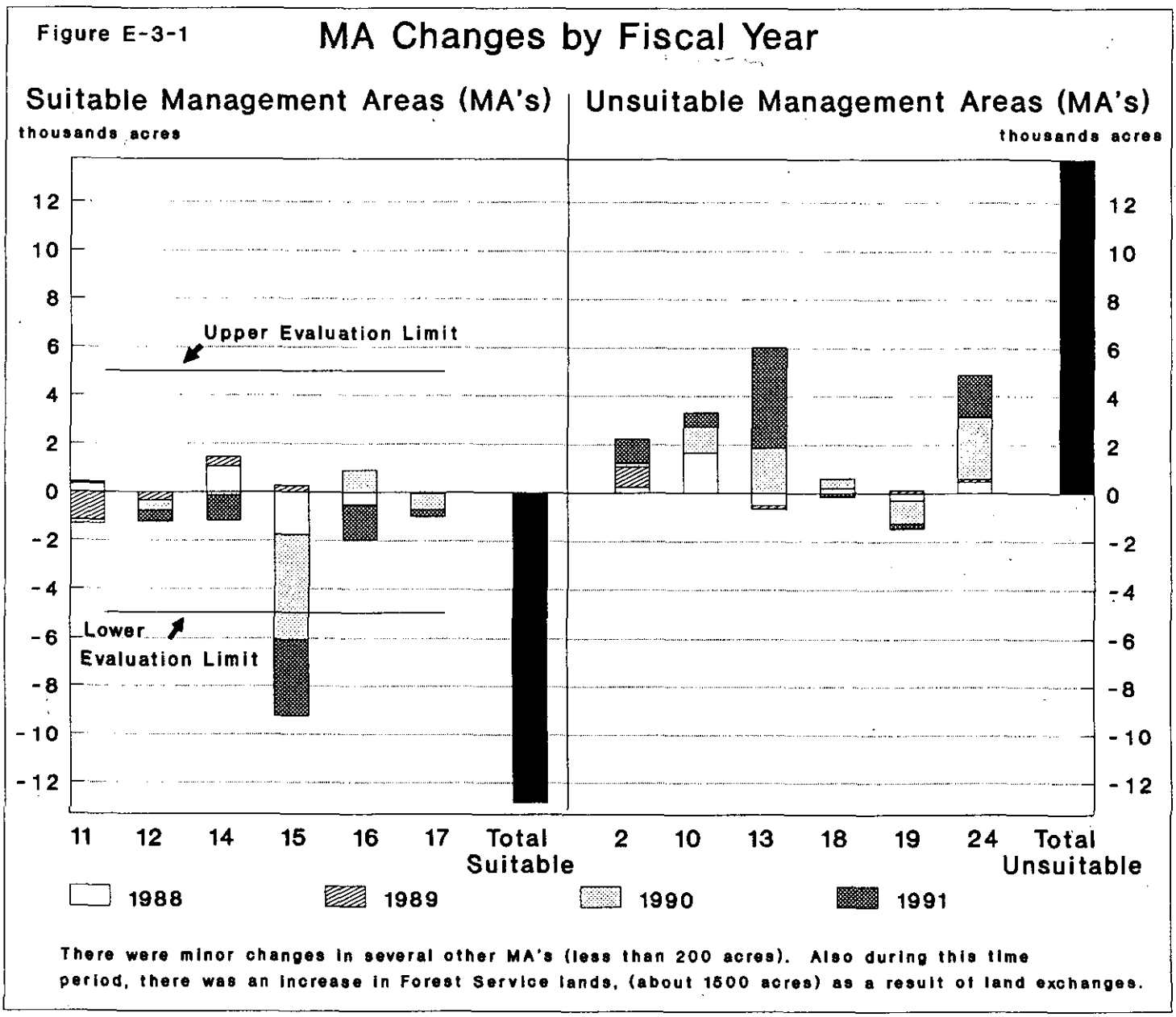
Evaluation: The cumulative MA changes in MA 15 are well beyond the +/- 5,000 acres total change limit. It appears that a downward trend has been established in MA 15 and that it will be necessary to amend that MA acreage in the Forest Plan, unless a significant trend reversal occurs. Any amendment needed will be done after the 5-year review period.

The most significant changes in FY 1991 were the result of errors found on-the-ground in old-growth habitat, big-game summer and winter range, sensitive visual resource areas, and non-productive forest land. The cumulative acreage changes for the last four years for all the remaining (unsuitable) MA's on the Forest are also displayed this year in Figure E-3-1. The bulk of the acreage gains in these unsuitable MA's, which offset the suitable timber acreage losses, were in MA-13 (old-growth) and MA-10 (big-game winter range).

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 Net Changes in Suitable Timberland
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	-3,181	-1,414	-281	-6,297
Total Net MA Change	-898	-1,207	+276	-8,968	-1,030	-990	-12,817

Figure E-3-1



There were minor changes in several other MA's (less than 200 acres). Also during this time period, there was an increase in Forest Service lands, (about 1500 acres) as a result of land exchanges.

TIMBER

Timber Harvest Deferrals: Monitoring Item E-7

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine the suitable timber acreage deferred from timber sales because of economics, resource conflicts, or other unforeseen reasons.
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	More than 10,000 acres cumulative change in any suitable management area (MA) after 5 years.

Background: Changes in acreage available for timber management could affect the allowable sale quantity (ASQ). The Forest Plan ASQ was determined by calculating the maximum amount of acreage available for timber harvest in the first decade while meeting all required standards and conditions.

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 regarding resource or economic conflicts not adequately accounted for in the Forest Plan. Examples are: road construction that was too expensive; or a threatened, endangered, or sensitive species found during project planning 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 result in cumulative watershed damage if the National Forest timber was harvested before adequate watershed recovery occurred on the private land. Please note that suitable timber acres rescheduled from one year to a later year within the Forest Plan period (FY's 1988-1997) are not considered deferred.

Results: Table E-7-1 displays deferred harvest acres by category for each suitable timber management area on the Forest for FY's 1988-91. The results show total harvest deferrals for both categories in FY 91 were down from FY 90. This confirms the downward trend which began in FY 90.

Evaluation: In **Category A**, during FY 1991, almost 2,300 acres were deferred. Changes in the interpretation of the Forest Plan open-road densities were the cause of over half of the deferrals (1,181 acres). Old-growth validation efforts that identified shortages from the required 10% level was the next most frequent reason for deferral (369 acres). Poor economic conditions identified during project analysis was the other most frequent reason (243 acres).

In **Category B**, during FY 1991, over 540 acres were deferred. Timber harvest on adjacent private land initiated almost all the deferrals (537 acres). These deferrals were necessary to insure that Forest Plan watershed guidelines were not exceeded (see Water Yield Increases, F-3). A downward trend is now established in this category.

Summary: For FY's 1988-91, MA 12 shows over 11,000 acres deferred. This is the largest amount of all the MA's, and is now over the Forest Plan limit of 10,000 acres. The grand total cumulative deferred MA acreage for both categories is now over 17,000 acres which is 8% more than the 15,740 acres projected annually for timber harvest (see Acres Sold for Timber Harvest, E-2). As a note of interest, the total amount deferred for harvest during the last four years as a result of appeals and litigation is 6,465 acres.

Table E-7-1 Harvest Acres Deferred in Suitable Timber Management Areas (MA's)

CATEGORY AND FISCAL YEAR	MA 11	MA 12	MA 14	MA 15	MA 16	MA 17	Grand Totals
Category A							
1988	15	340	25	0	0	0	380
1989	95	2,434	68	196	138	0	2,931
1990	89	779	107	120	298	0	1,393
1991	204	1,629	360	38	60	0	2,291
Subtotal Category A	403	5,182	560	354	496	0	6,995
Category B							
1988	0	2,580	274	314	0	0	3,168
1989	198	2,274	301	766	30	8	3,577
1990	403	912	62	1,164	168	80	2,789
1991	7	60	0	427	50	0	544
Subtotal Category B	608	5,826	637	2,671	248	88	10,078
Totals for A and B							
1988	15	2,920	299	314	0	0	3,548
1989	293	4,708	369	962	168	8	6,508
1990	492	1,691	169	1,284	466	80	4,182
1991	211	1,689	360	465	110	0	2,835
MA Totals for FY's 1988-91	1,011	11,008	1,197	3,025	744	88	17,073

Figure E-7-1

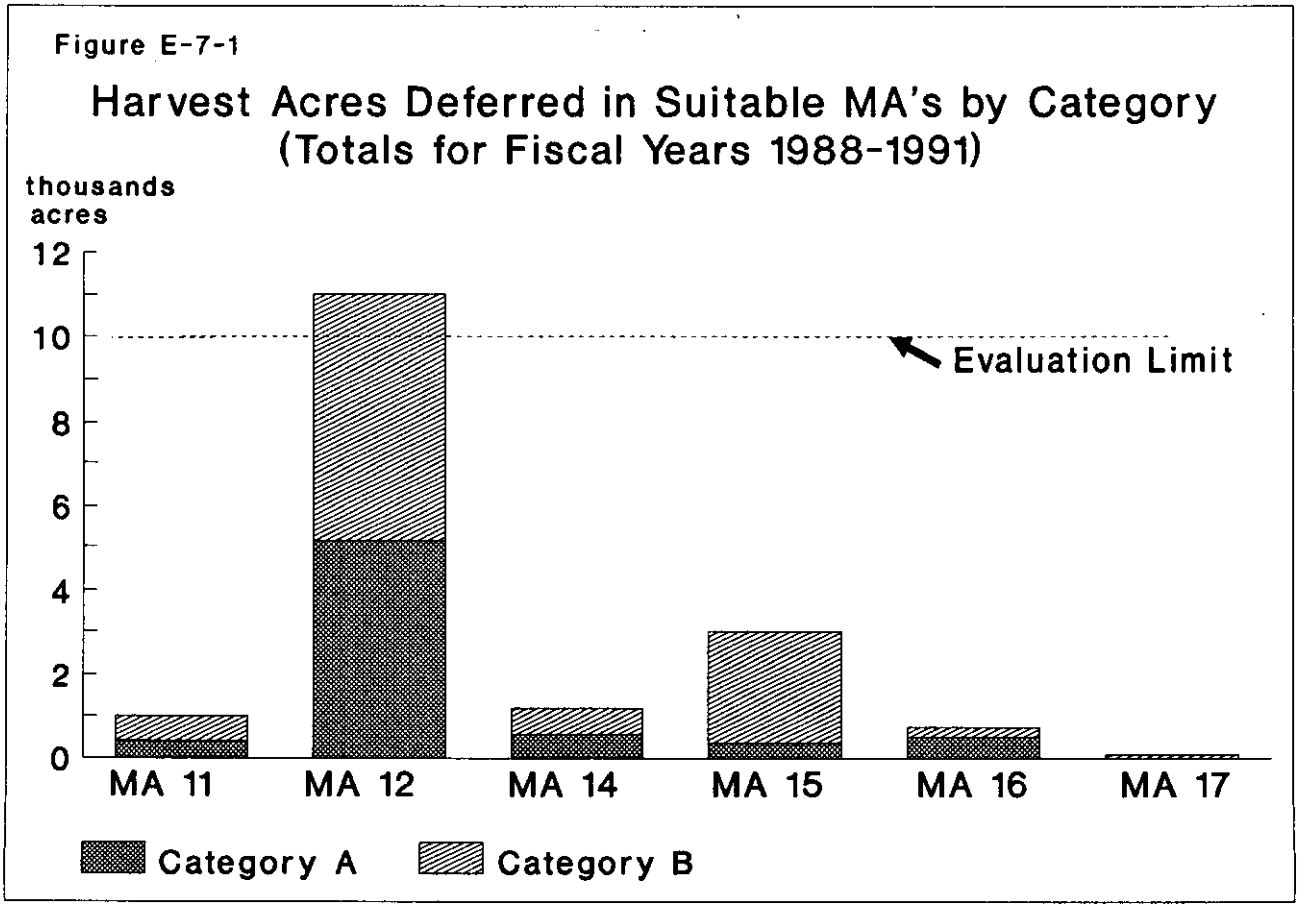
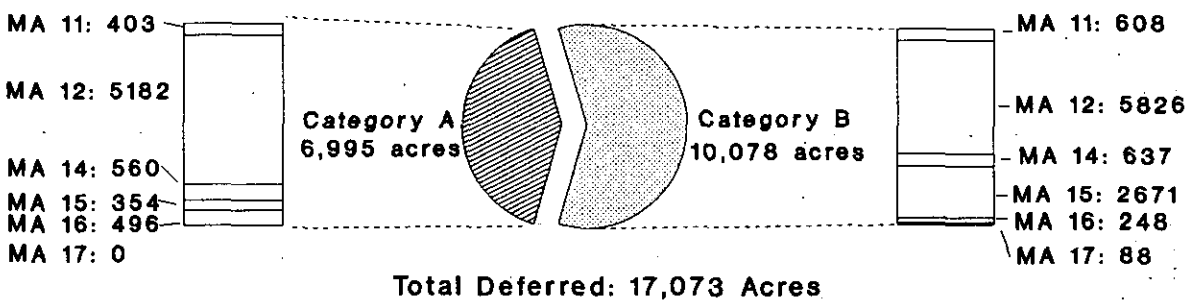


Figure E-7-1a

Harvest Acres Deferred in Suitable Timber MAs

Total Acres for Fiscal Years 1988-1991



Total Deferred: 17,073 Acres

Category A: Harvest deferred due to project-specific conclusions regarding resource conflicts not adequately accounted for in Forest Plan.

Category B: Harvest deferred due to externally-imposed situations, such as court injunctions or timber harvest on adjacent private land.

TIMBER

Harvest Area Size: Monitoring Item E-8

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Cutting unit size by forest type, management area, and District.
REPORTING FREQUENCY:	Every 2 years (1989, '91, '93, '95, '97)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Variation in trends of other resources beyond the natural variation that can be determined.

Background: The Forest Plan provides standards and guidelines for timber harvest area sizes for individual management areas (MA's). The purpose of these is to provide for integrated management of the major resources emphasized for the MA involved. In MA's 11 and 12, regeneration harvest area size is specified to generally approach 40 acres for elk and mule deer, and 20 acres for moose and whitetail deer. Whitetail deer are generally the management indicator species (MIS) for MA 11, winter range. Elk are generally the MIS for MA 12, summer range. In other MA's, no specific guides are given, but harvest area sizes should be consistent with the other management objectives for the area. During environmental analyses, 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.

Forestwide trends in harvest area size is most readily shown by the average timber harvest unit size on all the Ranger Districts. In addition, since timber harvest area size and the resultant opening size has been limited to 40 acres by the Forest Plan, data also needs to be collected to monitor the occurrence of approved timber harvest areas and resultant openings greater than 40 acres. These larger-than-40-acre openings may have undesirable effects on resources such as wildlife and dispersed recreation. However, the Forest Supervisor may approve an opening greater than 40 acres when natural catastrophic events such as fire, windstorms, insect attacks, or disease have damaged forest stands. Actions such as these are required to be analyzed in an environmental analysis.

Results: Data on timber harvest unit sizes was collected from the Sales Tracking and Reporting System (STARS) for timber sales sold in fiscal years 1988-91. Because several different harvest methods are in use on the Forest, the data was separated accordingly into clearcutting, seedtree cutting, shelterwood cutting, and all other harvest methods. Typically, clearcutting would leave a few scattered live and dead trees per acre for cavity-nester use; seedtree cutting would leave 4-8 trees per acre for natural seeding; shelterwood cutting would leave 9-15 trees per acre for natural seeding and visual or 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. These other harvest methods do not have the above-mentioned restrictions for harvest area size. Also, they typically would be expected to readily meet objectives for visual quality in MA's 16 and 17. Table E-8-1 and Figure E-8-1 show the average harvest area size, by fiscal year, for suitable MA's and harvest methods.

In FY 1990, 79 harvest areas or resultant openings greater than 40 acres were approved, while in FY 1991, two were approved. Most were in response to catastrophic results of mountain pine beetle insect attacks in lodgepole pine timber stands. In some cases, the newly-created openings were isolated and non-contiguous with existing older openings. In others, they were made up of both the planned harvest area plus the addition of older openings created by previous timber harvesting. Where openings are isolated, it is expected that at least 15-20 years will be necessary to provide vegetative cover dense enough that

the stand will no longer be classified as an opening. In the case of combined openings from previous timber harvest, less time (probably 10-12 years) will be needed to allow vegetative cover to once again close in adequately. Appendix B-2 lists the harvest areas resulting in larger-than-40-acre openings approved during FY 1990-91, as well as an estimate of how long it will take for the vegetative cover to eliminate the existing opening.

Evaluation: Average harvest area size by fiscal year shows trends anticipated during Forest planning. At this time, the average timber harvest unit size is below 40 acres in all MA's since the Forest Plan was approved. The one exception is for the clearcutting method in FY 1991 for MA 16 (72 acres). This was due to the harvest of lodgepole pine timber within a mountain pine beetle insect-infested area, and approved to exceed the 40-acre limitation in 1990.

In FY 1990-91, 81 timber harvest units were approved to exceed 40 acres in size and about 2,855 acres were involved. Most of these harvest units were affected by mountain pine beetle attacks in lodgepole pine. The effects of each of these harvest units were analyzed on a site-specific basis during environmental analysis to ensure that the effects were acceptable or could be appropriately mitigated. Monitoring of these approvals will continue in order to provide information on the efficiency of salvaging mountain pine beetle-infected timber and the potential cumulative effects of resultant openings greater than 40 acres. As more monitoring information becomes available, analyses will be made to correlate variations on other resources with various mixes of harvest unit or opening sizes.

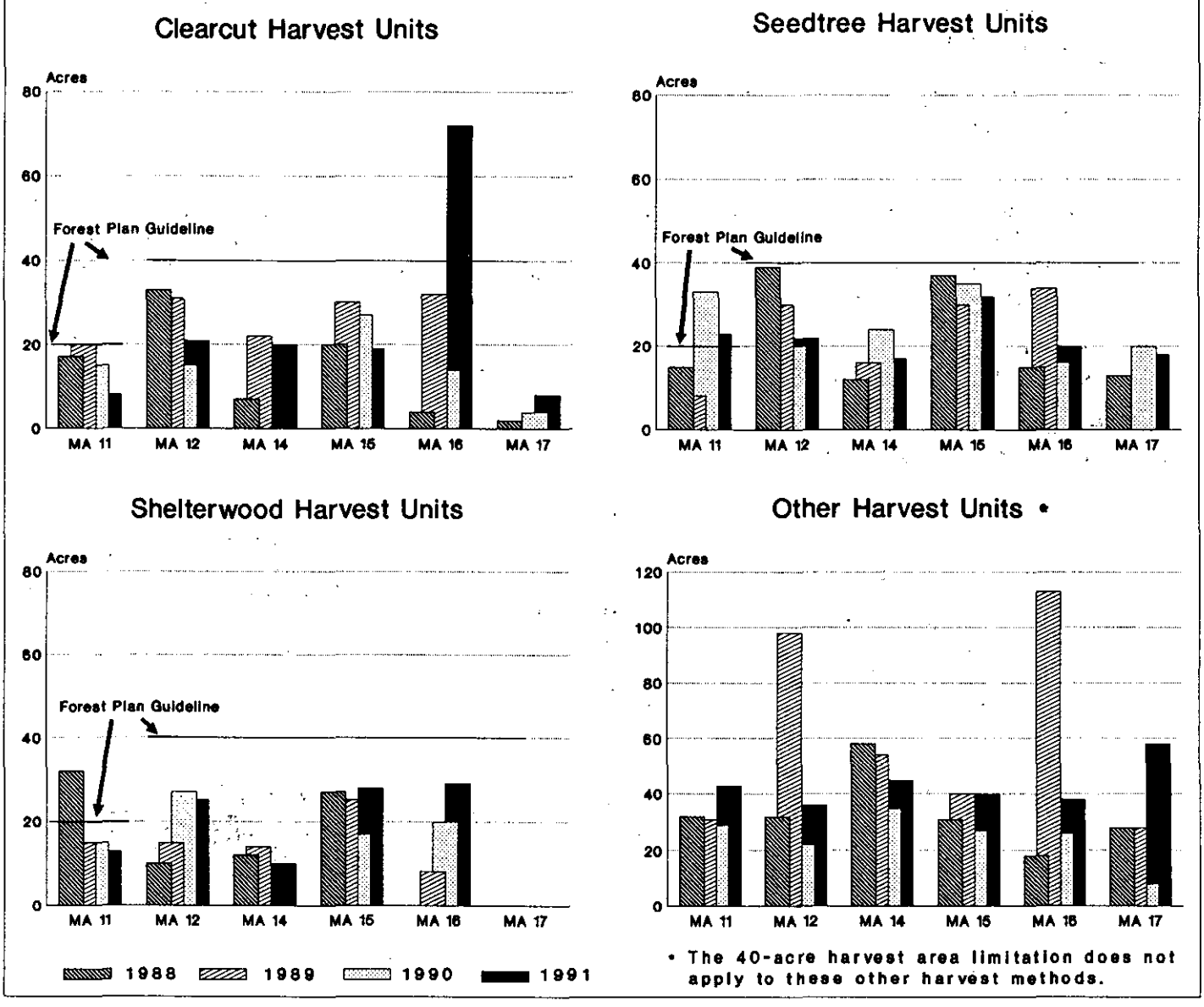
Table E-8-1 Average Harvest Area Size in Acres by Harvest Method and Management Area (MA)

Harvest Method and Fiscal Year	MA 11	MA 12	MA 14	MA 15	MA 16	MA 17
Clearcutting						
1988	17	33	7	20	4	2
1989	20	31	22	30	32	0
1990	15	15	0	27	14	4
1991	8	21	20	19	72	8
Seedtree Cutting						
1988	15	39	12	37	15	13
1989	8	30	16	30	34	0
1990	33	20	24	35	16	20
1991	23	22	17	32	20	18
Shelterwood Cutting						
1988	32	10	12	27	0	0
1989	15	15	14	25	8	0
1990	15	27	0	17	20	0
1991	13	25	10	28	29	0
All Other Methods*						
1988	32	32	58	31	18	28
1989	31	98	54	40	113	28
1990	29	22	35	27	26	8
1991	43	36	45	40	38	58

* The 40-acre harvest area limitation does not apply to these other harvest methods.

Figure E-8-1

Average Harvest Area Size by Harvest Method



• The 40-acre harvest area limitation does not apply to these other harvest methods.

Clearcut Acres Sold: Monitoring Item E-9

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Acres of clearcut harvest sold.
REPORTING FREQUENCY:	Annually (1989-1995)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Not defined.

Background: Congress has directed the Forest Service to reduce the amount of clearcutting by at least 25% by the year 1995. The purpose of this is the increasing concern with clearcutting on the National Forests. The baseline year for comparison is FY 1989. The Regional Forester has asked each Forest to monitor this item.

Results: Table E-9-1 displays the results since FY 1989. As can be seen, the acres of clearcut harvest sold has decreased during the last three years from 5,795 acres to 4,159 acres in FY 1991.

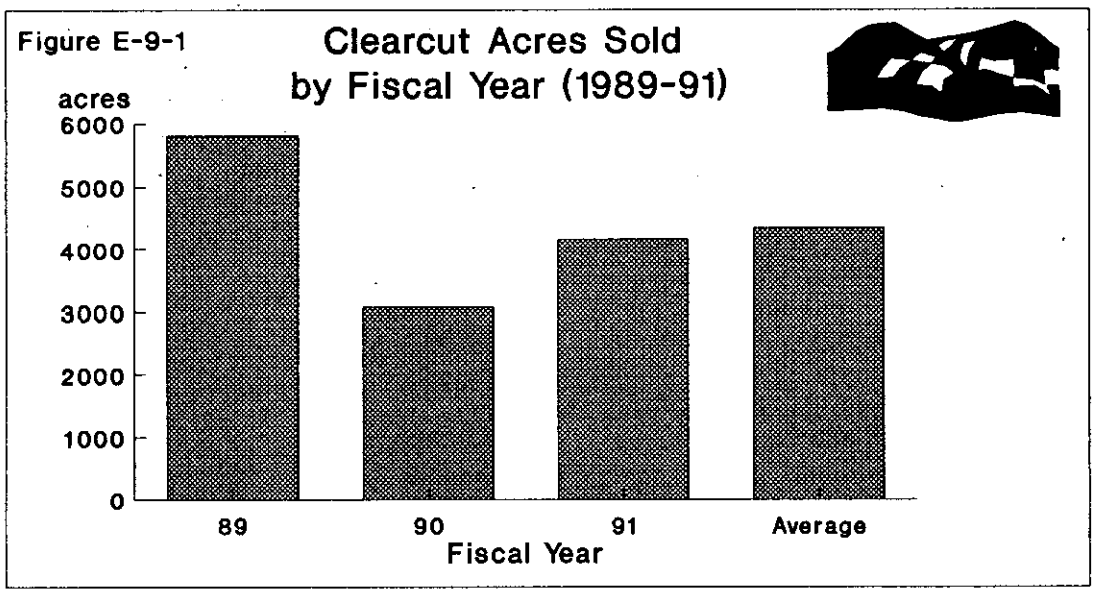
Evaluation: The Kootenai Forest is contributing to the Congressional direction to reduce the total amount of clearcut acres harvested.

Table E-9-1 Clearcut Acres Sold by Fiscal Year (FY)

Item	FY 89[1]	FY 90	FY 91	Average
Clearcut Acres Sold	5,795	3,068	4,159	4,341
Percent of Base Year	100	53	72	75

[1] FY 1989 is the baseline year for comparison.

Figure E-9-1



Soil and Water Conservation Practices: Monitoring Item F-1

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine if regional and project soil and water practices meet State Water Standards.
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Failure to meet State Standards.

Background: In October, 1988, the Forest began monitoring the Soil and Water Conservation Best Management Practices (BMP's). These BMP's are required forestwide to meet State water quality standards. The BMP's are various practices (such as erosion control) which are designed to reduce non-point sources of pollution. (A primary non-point source of pollution on a national forest is sediment which can reach a stream.) BMP monitoring consists of two important parts: **(1)** determining whether the practice (BMP) was applied on-the-ground as called for, and **(2)** if applied correctly, did it reduce the chances for sediment to enter a streamcourse. 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 addition to designing and evaluating the various practices (BMP's), the Forest also collects water samples near project sites to further ensure that downstream beneficial uses are being protected.

Projects that are evaluated for BMP application include timber sale road construction, timber harvest, mine site rehabilitation, and other activities that expose or disturb soil. Fiscal year 1991 BMP monitoring on the Kootenai Forest involved the auditing of 80 projects. The IMPLEMENTATION evaluations and the EFFECTIVENESS evaluations were both rated on the following scale:

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

RATING	IMPLEMENTATION	EFFECTIVENESS
Exceeds Acceptable	Operation Exceeds Requirements	Operation Improved Protection of Soil and Water Resources
Acceptable	Operation Meets Requirements	Adequate 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

Results: During fiscal year 1991, the BMP Monitoring program continued to grow. Over 1,860 IMPLEMENTATION evaluations were completed, which is an increase of 35% over the previous fiscal year. Of this group, ratings of acceptable and better were given 96% of the time, and ratings of unacceptable or worse were given 4% of the time. EFFECTIVENESS evaluations were completed for 870 practices. Of this group, ratings of acceptable and better were given 88% of the time, and ratings of unacceptable or worse were given 12% of the time (see Table F-1-2).

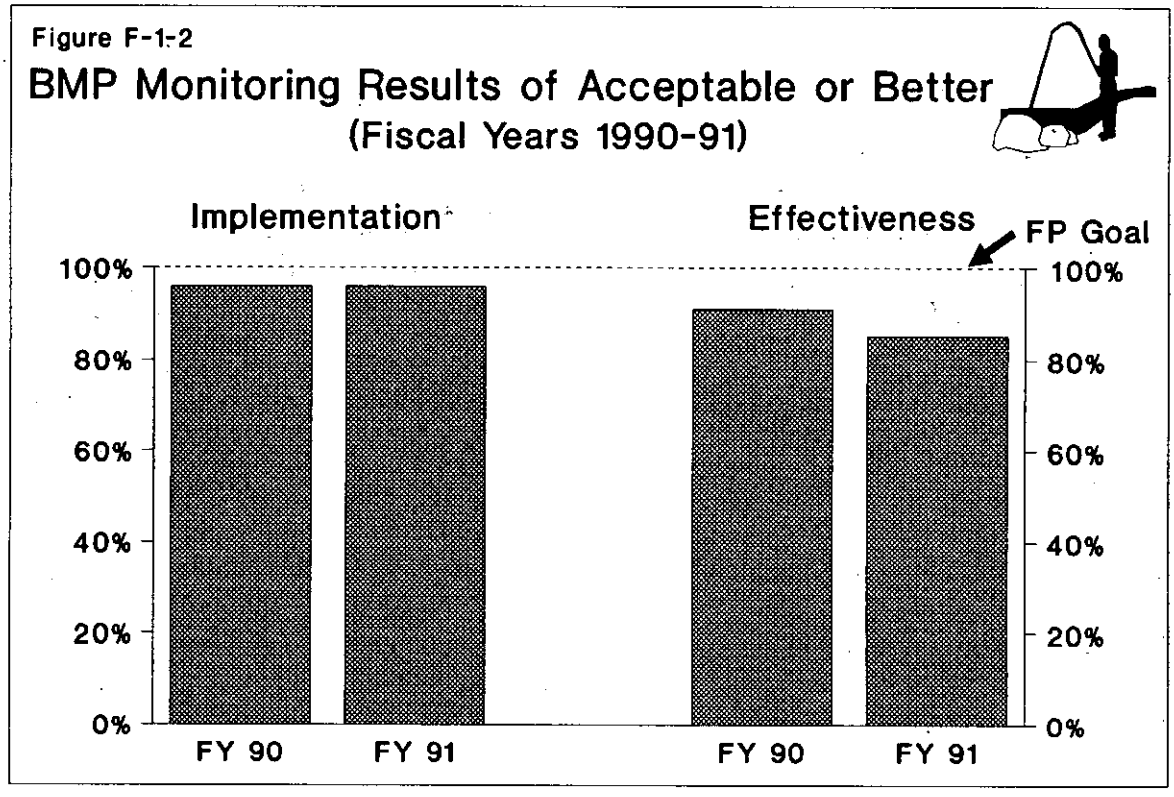
Table F-1-2 BMP Monitoring Results In Percent by Fiscal Year (FY)

	IMPLEMENTATION		EFFECTIVENESS	
RATING	FY 90	FY 91	FY 90	FY 91
Exceeds Acceptable	0	3	0	3
Acceptable	96	93	91	85
Unacceptable	4	3	8	12
Very Unacceptable	0.4	1	1	0
Grossly Unacceptable	0	0	0	0

Evaluation: The results of the fiscal year 1991 Kootenai Forest BMP monitoring evaluations can be compared to those made last year. During fiscal year 1991, ratings were similar for IMPLEMENTATION evaluations (96% for acceptable or better) but were lower for EFFECTIVENESS evaluations (88% for acceptable or better compared to 91% previously). The most frequent occurrence of EFFECTIVENESS violations involved two BMP's regarding erosion control (BMP #14.15 - Erosion Control on Skid Trails and BMP #14.12 - Erosion Prevention Control During Timber Sales). These two BMP's were unacceptable in 55 occasions.

The monitoring results indicate that most of the BMP's, when implemented properly, are working as designed. It is clear that more effort is still needed to increase the level of acceptable ratings which is the minimum rating desired. This will require that the Forest continue BMP training and followup to maintain and improve the efforts currently being made in expanding the BMP monitoring program. This includes close attention to BMP application in all aspects of project planning, contract preparation and administration, as well as the use of a mandatory set of BMP's for all timber sales.

Figure F-1-2



Stream Sedimentation: Monitoring Item F-2

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine sediment impacts on fishery habitat.
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	20% increase in bedload and suspended solids.

Background: The Forest Plan identified seven streams to install monitoring stations to measure bedload and suspended solids. They are: Big, Sunday, Bristow, Red Top, Rock, Granite and Flower Creeks. Upon further evaluation, it became evident that three of these streams were too large to provide meaningful data for of sedimentation monitoring. It was determined that a smaller portion (sub-drainage) of these three streams would be more representative of the normal project activities such as timber sales. These portions of three drainages, plus the other four complete drainages are monitored for the following parameters:

Table F-2-1 Stream Sedimentation Monitoring Parameters by Drainage

Drainage Name	Channel Cross-Section	Crest Gage	Suspended Sediment	Flow	Other	Total Number of Monitoring Stations
Big Creek[10]	Yes	Yes	No[1]	No	Yes[2]	8
Sunday Creek[10]	No	Yes	Yes	Yes	No	2
Bristow Creek[10]	No	Yes	Yes	Yes	Yes[3]	2
Red Top Creek	Yes	Yes	Yes	Yes	Yes[4]	1
Rock Creek	No	Yes	Yes	Yes	Yes[5]	10[5]
Granite Creek	Yes[7]	No	Yes	Yes[8]	No	1
Flower Creek	No	No	Yes	Yes[9]	No	3

[1] Two suspended sediment samplers were installed in 10/91 (FY 92). [2] Fish population survey.
[3] Substrate core sampling, redd count survey, channel stability survey, daily flow recorder.
[4] Macro-invertebrate sampling, flow recorder, and embeddedness surveys.
[5] All data collected by Hydrometrics, a consulting firm for Asarco Inc.
[6] Chemical analysis of water samples, substrate core sampling, and embeddednes surveys.
[7] Channel cross-sections were done in 1989 and are planned for 1992. [8] Recording flow station.
[9] Stream flow station is operated by the U.S. Geological Survey. [10]Only sub-drainages are monitored in this stream.

Results: The data collected in FY 1991 is being used to help establish the range in variation of background levels for the seven Forest Plan Monitoring streams. The data collected thus far have proved to be inconclusive in allowing us to determine if a 20% increase in bedload and suspended solids has been surpassed. The purpose of the monitoring item may have to be re-evaluated in the 5-year review due to our inability to determine if the data we are collecting is an effect of Forest activities or natural variations in the stream systems.

Water Yield Increases: Monitoring Item F-3

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine the cumulative level of water yield increases and the effects on stream channels.
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	20% increase in channel stability rating, or if 20% of watersheds exceed hydrologic guidelines.

Background: Water yield estimations for project planning utilize the Kootenai National Forest water yield model. This model calculates the peak flow increase for a watershed or sub-watershed. The results are displayed on a percentage basis and include both past and proposed activities in the calculations. If peak flows exceed acceptable limits, stream channel damage can probably be expected. Water yield estimation monitoring is done to identify watersheds where Forest Plan standards will be exceeded. When this occurs, projects can be modified or deferred to ensure that State Water Quality goals are met.

Results: In FY 1991, the Kootenai water yield model was used to estimate the peak flow increase on 252,400 acres which included both National Forest and private land (see Table F-3-2). Of this total area analyzed, 5% exceeded the Forest water yield guidelines.

Evaluation: The combined totals for FY's 1988-91 show that of the 1,387,300 acres analyzed for peak flow increases on both public and private land, 26% exceed the limits for water yield increase. Most of the analyzed area occurs on the Fisher River Ranger District (see Table F-3-1), which has also experienced the most acreage that exceeds the water yield limits (50% of 544,760 acres). This Ranger District is located in the southeast corner of the Forest which is an area that contains large segments of intermingled private land.

Significant amounts of timber harvest have recently occurred on the intermingled private land within the Forest. Water yield calculations were done for these areas as a part of project planning for potential Kootenai Forest timber sales, and the private land characteristics were included. Most of these areas were found to exceed allowable peak flow levels, even though there were few recent or previous activities on National Forest lands. As discussed in Harvest Deferrals (E-7), the Forest has deferred harvest for this reason during 1988-1991. These deferrals for watershed limits have significantly reduced timber sale opportunities on the Fisher River District (see Figure F-3-3a).

Since many of the drainages that were studied in the first half of fiscal years 1988-91 had significant amounts of private land, the figure of 26% of the acreage exceeding limits probably overstates the current Forestwide situation. This conclusion is based on the observation that the percentage of acreage exceeding guidelines has declined steadily from 34% in FY 1988-89 to 5% in FY 1991 (see Table F-3-2). One of the reasons is that drainages with less private land were included in the FY's 1990-91 analysis. It is presumed that the Forestwide average of acreage that exceeds the water yield limit will further decline as more watersheds are analyzed with predominantly National Forest land. As can be seen in Table F-3-3, on a Forestwide basis, 12% of the total land area now exceeds the water yield guidelines which is within the evaluation limit of 20%. With the evidence to-date in the inventory, it is estimated that 12-15% of the total land area will eventually exceed the guidelines when all the watersheds have been analyzed.

Although it appears that the Forest will eventually be in compliance with this monitoring item, the locations on the Forest with intermingled landownerships will still be significantly affected. As stated above, these

areas are primarily located in the southeast corner of the Forest where the Montana Watershed Cooperative has agreed to evaluate harvest schedules and methods to ensure that State Water Quality standards are met. This cooperative includes the Kootenai, Flathead and Lolo Forests, the State of Montana, Plum Creek Timber Company, and Champion International Corporation.

Table F-3-1 *Watersheds Analyzed by Ranger District, FY's 1988-91 (includes private land)

Ranger District	Total Acres of Watersheds Analyzed	Acres of Watersheds Exceeding Water Yield Guidelines	Percent
Rexford	128,910	7,710	6
Fortine	98,750	6,790	7
Three Rivers	384,070	42,900	11
Libby	153,110	29,510	19
Fisher River	544,760	269,660	50
Cabinet	77,700	0	0
Totals	1,387,300	356,570	ave. 26

* Errors were found in last years report and have been corrected in this report.

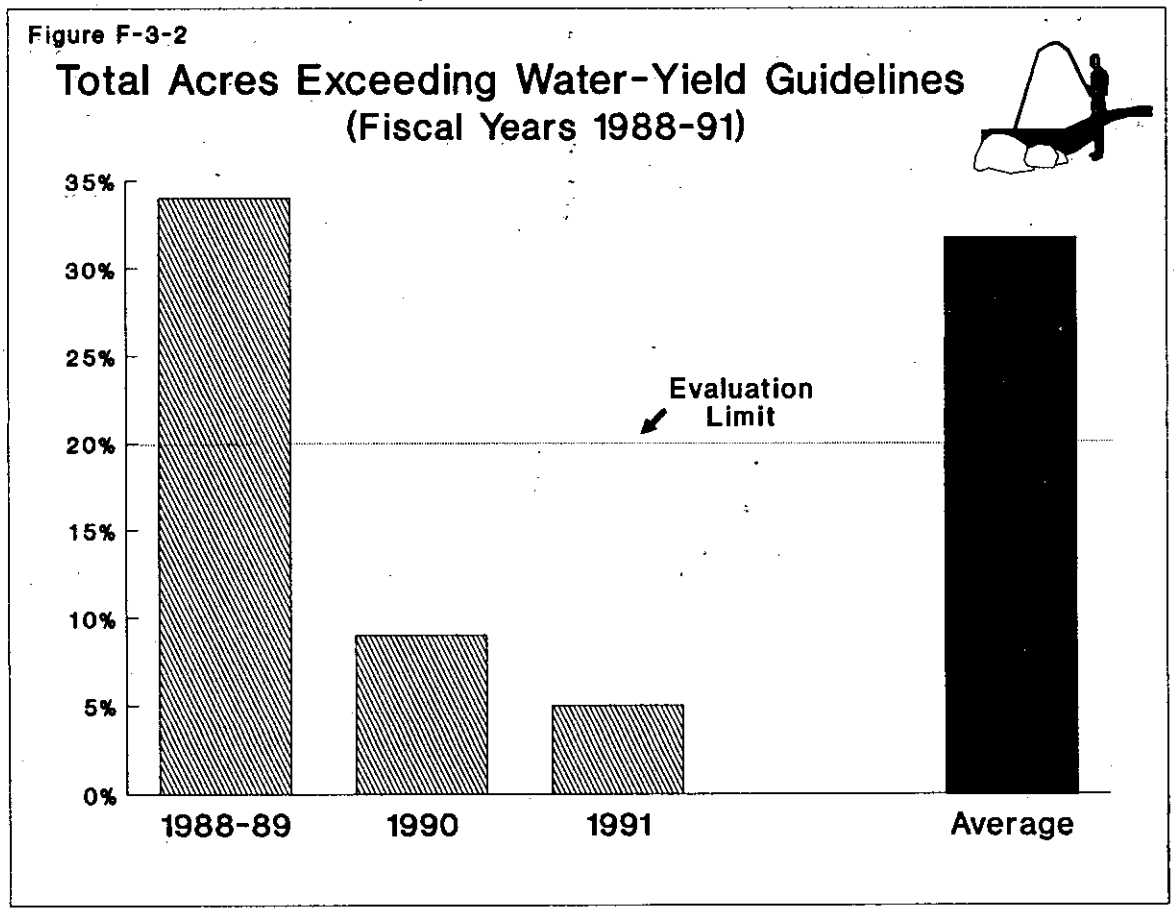
See Figure F-3-3a for map of areas that have been analyzed.

Table F-3-2 ***Watersheds Analyzed by Fiscal Year**
(includes private land)

Fiscal Year	Total Acres of Watersheds Analyzed	Acres of Watersheds Exceeding Water Yield Guidelines	Percent
1988-89	976,020	328,990	34
1990	158,880	14,560	9
1991	252,400	13,020	5
Totals	1,387,300	356,570	ave. 26

* Errors were found in last years report and have been corrected in this report.

Figure F-3-2



HUMAN AND COMMUNITY DEVELOPMENT

Emerging Issues: Monitoring Item H-2

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Emerging issues
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Issues surfaced that were not included in or analyzed for effect by the Plan.

BACKGROUND: Newly emerging issues could affect the Forest's ability to implement the Forest Plan as intended. As a part of monitoring, such potential issues will be identified. At the 5-year review, an analysis will be made to determine if these potential issues could significantly affect programmed output levels or the full implementation of Forest Plan standards and guidelines. In addition to monitoring emerging issues, the Forest is also monitoring the original Forest Plan issues to understand how they may be changing and to determine if the Plan is resolving them in the intended fashion. In fiscal year 1991, many of the prior years concerns were validated with some additional emphasis, as well as new concerns being mentioned.

Emerging or Potential Forest Issues Not Specifically Evaluated in the Forest Plan:

Air Quality Management - Air quality continues to be a national concern, and locally it seem to focus on the increasing public non-acceptance of slash burning especially in the vicinity of Libby, Troy and Eureka. An important future consideration could be the evolving EPA restrictions regarding smoke from timber harvest slash burning, especially in the Spring and Fall.

Biodiversity - Management of biodiversity is an issue which is increasing nationally, and locally the concern appears to be surfacing in items such as riparian and wetland management, un-even aged management, sustained ecosystem management, habitat fragmentation, and biological corridors.

Impacts to Forest Service Activities from Adjacent Private Lands - In watersheds which contain mixed ownership of Forest Service and private lands, intensive harvest on the private lands has brought estimated water yields to threshold levels of Forest Plan standards. As a result, planned timber sales are no longer possible during the Forest Plan period for certain drainages, and this has had an impact on the Forest programmed harvest volume.

Noxious Weeds - The public is becoming aware of the effect on land uses and values as a result of the increased spread of various noxious weeds, especially spotted knapweed. What the potential overall effect will be is still an unanswered question.

Recreation and Off-Road-Vehicle (ORV) Management - The public is becoming more aware of quality recreation opportunities that are and could be available to them. Examples are: roadless hunting and trophy bull opportunities. Along with this awareness are concerns about access to these opportunities and how ORV's should be managed to protect these resources.

Sensitive Plants and Animals - There is increasing concern for sensitive species management to ensure that such plants and animals including fish will not become threatened or endangered. As the inventory of these plants and animals becomes more complete, questions arise as to how to best provide for their protection and what will be the overall effect on current outputs such as timber sell, recreation access, etc.

Wolf Recovery - The Forest has an obligation to provide for the recovery of all threatened and endangered species. Currently there is a plan for the recovery of the wolf in the northeast corner of the Forest. Forest monitoring indicates that wolf recolonization is occurring both within and outside the designated recovery area. What effect this could have on other resource uses is unknown at this time.

Continuing Forest Issues that May Still Affect the Forest Plan:

The Forest Plan initially identified and addressed 13 public issues. They were: Timber Volume, Transportation Facilities (primarily new roads and their management), Roadless Recreation, T & E Species, Special Wildlife Habitat (especially old growth, riparian areas and snags), Local Economic Impacts, Wilderness, Minerals and Oil/Gas, Wildlife and Fish Habitat (including water quality protection), Esthetics, Landownership Adjustment, Diseases and Pests, and Fire Management. The following are those that still appear to resist resolution:

T & E Species (Grizzly Bear Management) - Standards for grizzly bear habitat management continue to evolve, and some aspects were not well clarified during Forest planning activities. Clarification items have included habitat delineation and road access management. These have had significant effects on timber sale scheduling and have also affected other resource use such as recreation access and mining proposals.

Wildlife and Fish Habitat (State Water Quality Management) - Clarification of State Water Quality Standards and Best Management Practices (BMP's) has resulted in stricter compliance than anticipated when dealing with catastrophic events such as the harvest of insect-infested timber. As a result, timber outputs have been more difficult to achieve than anticipated. Concerns have also been expressed about the adequacy of the Forest water yield model, especially where private land is intermingled with National Forest. This model is used to calculate compliance with the Forest Plan water quality standards. These standards require adherence to the State Water Quality Standards.

Local Economic Impacts (Timber Supply) - The shortage of available timber is becoming a concern for the economic well-being of the local communities because of their strong dependence on National Forest timber. Timber volume under contract has fallen from 590 MMBF to 233 MMBF in the last 5 years (FY 87-91).

Timber Volume (Timber Inventory) - A recent inquiry from the public has raised reasonable questions about how forest inventory data was used in the FORPLAN model during the development of the Forest Plan timber harvest calculations. These questions raise the possibility that the inventory was overstated which would mean that the harvest calculations might also be in error on the high side.

Transportation Facilities (Road Management and Public Access) - Strong concerns are being expressed about the lack of public road access to various areas for firewood gathering, huckleberry picking, hunting, handicapped and senior citizens ability to move about, etc. Some of these concerns infer that road access restrictions are more than intended in the Forest Plan.

Special Wildlife Habitat (Old Growth and Snag Habitat Management) - The management of old growth habitat is still evolving and the potential impact on other resource uses is still unknown. Concern is also growing that serious shortages of snag habitat are developing in many locations on the Forest. This is the result of previous timber harvest practices and firewood gathering. What effect this could have on future timber sale policies is unknown.

Minerals and Oil/Gas (Potential Mineral Development) - The proposed development of major mines on the Forest and the possibility of additional mine developments will have implications for the management of non-mineral resources on the Forest and for the community as well. Examples are: recreation access and grizzly bear recovery.

Wildlife and Fish Habitat (Elk Security/Cover/Forage) - Experience is suggesting that the relative location and size of elk cover areas may be more important than the actual amount or percentage of cover provided. This is also related to a concern that inadequate elk security is being provided in several areas on the Forest.

HUMAN AND COMMUNITY DEVELOPMENT

Forest Plan Costs: Monitoring Item H-3

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine if the costs of producing outputs that were used in the Plan continue to be valid.
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	A deviation of more than 10% from the cost data used to calculate present net value in the Plan.

Background: During the development of the Forest 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 which 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 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 which 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, roads constructed primarily for timber harvest, site preparation, reforestation, and precommercial thinning. The baseline unit cost figures, or those used to calculate present net value (PNV) in the Plan, were extracted from the planning record, and inflated to fiscal year 1991 dollars in order to provide comparability. The fiscal year unit cost values were obtained from Forest accounting reports and the Forest management attainment reports and inflated to fiscal year 1991 dollars. 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. Reforestation costs include all reforestation-related costs including co-operative work required by timber sale contractors. All acres with reforestation work are represented in the output level. Table H-3-1 shows the baseline, and FY's 1988-1991 unit cost data for these items.

Results: Table H-3-1 shows that **timber sale preparation unit costs** have increased significantly over the projected level during the last two fiscal years (+42% in FY 90 and +52% in FY 91). The overall trend during the last four years is now upward and the average increase is 40% over the projected unit costs used in the Forest Plan. This trend is due to the increasing complexity in timber sale preparation along with a concurrent decrease in the amount of timber volume being sold. The FY 91 costs were also skewed by the significant volume (about 51 MMBF) advertised in September, 1991 but not sold until the beginning of FY 92. For more detail on these aspects, please refer to Items E-1 thru E-3 and E-7. The effect of this trend will be evaluated next year during the formal 5-year review. At that point, more data will be available to understand the current cost structure of the Forest.

Timber roads unit costs have been lower than projected during the first three of the last four fiscal years, but that trend appears to have reversed in FY 1991. A review of the earlier reduced costs indicates that proportionally more areas already roaded contributed to timber sell volume during fiscal years 1988-90. This was a result of accelerated lodgepole pine timber salvage harvesting in the most economically attractive areas. This harvest trend is beginning to change, and it is expected that more timber sales will require road construction than in the recent past. In addition, a lag is present in the calculations, because road building is often a result of timber sold in the prior fiscal year rather than the current year. For FY 91, the lower amount of timber sold than in FY 90 makes the unit cost increase more dramatic than would be expected.

Reforestation unit costs increased about 7% over fiscal year 1990. They are also 2% above the projected unit costs used in the Forest Plan. The 4-year average of +11% above the projected unit costs is close to the variability limit (+/- 10%). Due to this closeness, one more year's data will be helpful to determine significance.

Pre-commercial thinning unit costs also continue the trend established early during the last four fiscal years. These reduced costs appear significant, but pre-commercial thinning accounts for about only 0.2% of the total contribution to PNV costs.

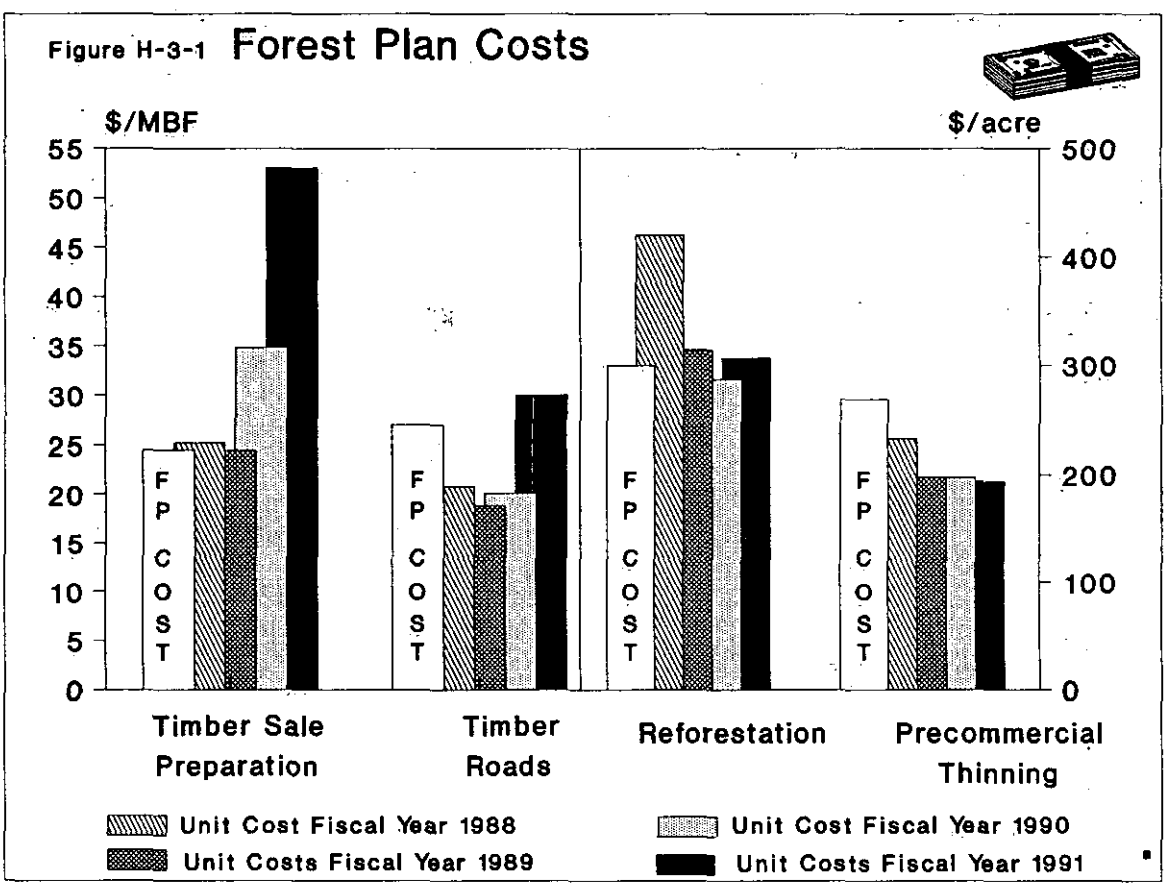
Evaluation: While timber sale preparation costs have increased an average of 40%, the average 4-year weighted total timber sale costs of $55.22/MBF (which includes timber sale preparation and road construction costs) is still within $4.74 per MBF or 9% of the $50.48/MBF projected in the Plan (see Table H-3-1). This is because timber roads costs are less than expected (-22%). We'll continue to monitor these costs.

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

Cost Item	Units	Unit Costs Projected In Plan	FY 88	FY 89	FY 90	FY 91	4-Year Weighted Average	% Change From Projected
Timber Sale Preparation	$/MBF	24.54	25.19	24.45	34.84	53.04	34.19	+40
Timber Roads	$/MBF	26.94	20.80	18.79	20.08	30.02	21.03	-22
Reforestation	$/Acre	299.71	420.07	313.98	287.42	307.04	332.13	+11
Precommer. Thinning	$/Acre	268.54	232.52	198.43	197.57	193.83	205.59	-23

* All unit costs in this table have been updated to FY 91 dollars to account for inflation and to provide comparability.

Figure H-3-1 Forest Plan Costs



HUMAN AND COMMUNITY DEVELOPMENT

Forest Plan Budget Levels: Monitoring Item H-4:

ACTION OR EFFECT TO BE MEASURED:	Assess Forest budget levels and their effects on Forest Plan implementation.
REPORTING FREQUENCY:	Annually (1988-1992)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	10% deviation by funding item from the predicted levels in the Plan.

Background: The budget process is directly related to the Forest Plan, but also influenced by other factors. Changes in programs implemented with the Plan could not be readily initiated because budgets for FY 1988 and to an extent, FY 1989, were already defined and submitted in previous fiscal years. Therefore, deviations from the Plan are likely to be greater in the first few years of implementation. Also, 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 after four years, it is apparent that a re-analysis of costs will be useful to provide a foundation for the continuing evaluation of the Plan. This re-analysis will be made during the 5-year review and evaluation process.

Results: Table H-4-1 (next page) shows the planned budget, FY's 1988-91 actual expenditures, and the percentage difference between them. When averaged over all four years, only the Co-operative Trust Funds (Item 29) and Brush Disposal (Item 31) stayed within the 10% level. Other budget items varied from 3 to 275 percent of planned levels.

Evaluation: In order to evaluate this information, the major Forest programs were considered. For these major items, all applicable budget items were grouped and added together. Other budget items, which reflect small, highly variable programs, can be more accurately evaluated when five years of data become available. Data for FY's 1988-91 were then averaged to smooth out year-to-year variations. 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 FY's 1988-91. All outputs for the applicable budget items were included. To some extent, some mis-representation was introduced by adding some outputs together (for instance, developed recreation and dispersed recreation) but overall results do show the major trends. Table H-4-2, on a following page, shows the results of this analysis. An evaluation of each budget area follows Table H-4-2.

Table H-4-1 Projected & Actual Budget Used to Implement the Forest Plan (from Forest Plan App.7, in thousands of dollars)

Funding Item	Budget Activity	FY 78[1] Dollars	Planned FY 88[2] Dollars	Actual FY 88 Dollars	FY 88 % of Planned Dollars	Planned FY 89[3] Dollars	Actual FY 89 Dollars	FY 89 % of Planned Dollars	Planned FY 90[4] Dollars	Actual FY 90 Dollars	FY 90 % of Planned Dollars	Ave. of FY 88-90 % of Planned Dollars
00	General Administr. (approp.)	1,465	2,417	2,019	84	2,552	1,967	77	2,693	1,674	62	74
01	Fire	530	875	681	78	923	683	74	974	716	74	75
02	Fuels	59	97	46	47	103	26	25	108	29	27	33
03-05	Timber	2,648	4,369	3,296	75	4,613	3,028	66	4,867	3,154	65	69
06-07	Range	59	97	66	68	103	59	57	108	59	54	60
08	Minerals	287	474	279	59	500	256	51	528	290	55	55
09	Recreation	561	926	613	66	977	514	53	1,031	587	57	59
10	Wildlife and Fish	648	1,069	387	36	1,129	556	49	1,191	648	54	47
11	Soil, Air, Water	269	444	247	56	469	249	53	494	448	91	66
12	Facility Maintenance	145	239	172	72	253	161	64	267	164	62	66
13-15	Lands/Land Management	156	257	105	41	272	104	38	287	144	50	43
42-43	Lands-Status/Acquisition	96	158	32	20	167	30	18	176	20	11	16
16	Landline Location	285	470	326	69	496	371	75	524	338	65	70
17	Road Maintenance	764	1,261	979	78	1,331	953	72	1,404	1,038	74	74
18	Trail Maintenance	115	190	145	76	200	84	42	211	172	81	67
19	Co-op Law Enforcement	12	20	45	227	21	35	167	22	34	154	183
20	Reforestation-Appropriated	871	1,437	833	58	1,517	1,012	67	1,601	957	60	61
21	TSI-Appropriated	562	927	578	62	979	758	77	1,033	537	52	64
23	Tree Improvement	20	33	31	94	35	47	135	37	45	122	117
26-28	KV *(Trust Fund)*	1,427	2,355	2,312	98	2,486	2,704	109	2,623	3,924	150	119
29	CWFS-Other (Trust Fund)	348	574	586	102	606	773	128	640	637	100	110
30	Tmbr.Salv.Sales (Perm.Fund)	275	454	538	119	479	981	205	505	1,345	266	196
31	Brush Disposal (Perm. Fund)	694	1,145	1,060	93	1,209	1,215	101	1,276	1,333	105	99
32	Range Improvement	6	10	8	81	10	5	48	11	8	73	67
33	Recreation Construction	99	163	126	77	172	142	82	182	25	14	58
34	Facility Construction-FA&O	111	183	19	10	193	0	0	204	6	3	4
35	Engineering Constr.Support	2,360	3,894	2,734	70	4,111	2,315	56	4,338	2,486	57	61
36	Constr.-Capital Invest. Roads	1,801	2,972	113	4	3,137	355	11	3,310	1,186	36	17
37	Trail Construction/Reconstr.	32	53	26	49	56	32	57	59	31	53	53
24,38	Timber Rd.Constr.-PC/Elect.	2,399	3,958	2,500	63	4,179	1,916	46	4,409	1,535	35	48
	TOTALS	19,104	31,522	20,902	66	33,279	21,331	64	35,113	23,570	67	66

[1] FY 78 is the base year for costs in Forest Planning. [2] FY 88 is 1.65 times FY 1978 to account for inflation. [3] FY 89 is 1.742 times FY 1978 to account for inflation.
[4] FY 90 is 1.838 times FY 1978 to account for inflation.

Table H-4-1 (continued) **Projected & Actual Budget Used to Implement the Forest Plan** (in thousands of dollars)

Funding Item	Budget Activity	FY 78[1] Dollars	Planned FY 91[5] Dollars	Actual FY 91 Dollars	FY 91 % of Planned Dollars	Planned FY 92 Dollars	Actual FY 92 Dollars	FY 92 % of Planned Dollars	Ave. of FY 88-91 % of Planned Dollars
00	General Administr. (approp.)	1,465	2,800	2,220	79	NA	NA	NA	76
01	Fire	530	1,013	796	79	NA	NA	NA	76
02	Fuels	59	113	43	38	NA	NA	NA	34
03-05	Timber	2,648	5,060	3,629	72	NA	NA	NA	69
06-07	Range	59	113	48	43	NA	NA	NA	56
08	Minerals	287	548	329	60	NA	NA	NA	56
09	Recreation	561	1,072	806	75	NA	NA	NA	63
10	Wildlife and Fish	648	1,238	873	70	NA	NA	NA	53
11	Soil, Air, Water	269	514	481	94	NA	NA	NA	73
12	Facility Maintenance	145	277	317	114	NA	NA	NA	78
13-15	Lands/Land Management	156	298	244	82	NA	NA	NA	53
42-43	Lands-Status/Acquisition	96	183	6	3	NA	NA	NA	13
16	Landline Location	285	545	462	85	NA	NA	NA	73
17	Road Maintenance	764	1,460	1,314	90	NA	NA	NA	78
18	Trail Maintenance	115	220	223	101	NA	NA	NA	75
19	Co-op Law Enforcement	12	20	26	113	NA	NA	NA	166
20	Reforestation-Appropriated	871	1,437	1,586	95	NA	NA	NA	70
21	TSI-Appropriated	562	927	457	43	NA	NA	NA	59
23	Tree Improvement	20	33	39	102	NA	NA	NA	113
26-28	KV (Trust Fund)	1,427	2,355	4,235	155	NA	NA	NA	128
29	CWFS-Other (Trust Fund)	348	665	750	113	NA	NA	NA	110
30	Tmbr.Salv.Sales (Perm.Fund)	275	526	2,683	511	NA	NA	NA	275
31	Brush Disposal (Perm. Fund)	694	1,326	1,462	110	NA	NA	NA	102
32	Range Improvement	6	11	7	61	NA	NA	NA	66
33	Recreation Construction	99	189	199	105	NA	NA	NA	70
34	Facility Construction-FA&O	111	212	1	0	NA	NA	NA	3
35	Engineering Constr.Support	2,360	4,510	2,588	57	NA	NA	NA	60
36	Constr.-Capital Invest. Roads	1,801	3,442	410	12	NA	NA	NA	16
37	Trail Construction/Reconstr.	32	61	76	124	NA	NA	NA	71
24,38	Timber Rd.Constr.-PC/Elect.[6]	2,399	4,584	2,039	44	NA	NA	NA	47
	TOTALS	19,104	36,508	28,349	78	NA	NA	NA	69

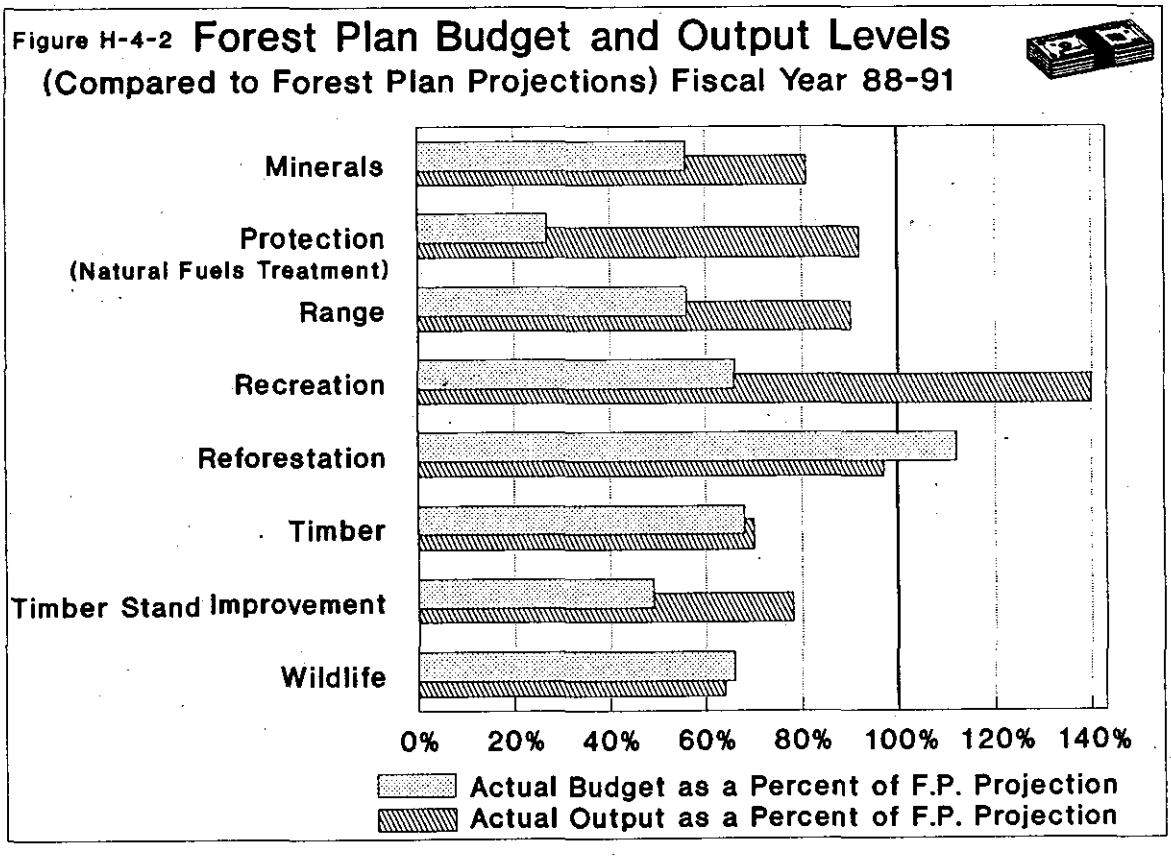
[1] FY 78 is the base year for costs in Forest Planning.

[5] FY 91 is 1.911 times FY 1978 to account for inflation.

[6] PC = Purchaser Credit established.

Table H-4-2 Forest Plan Budget & Output Levels for Fiscal Years 1988-91

Activity or Outputs	Actual Budget as a Percent of Forest Plan	Actual Output as a Percent of Forest Plan Projection
Minerals	56	81
Protection, Natural Fuels Treatment	27	92
Range	56	90
Recreation	66	140
Reforestation	112	97
Timber	69	70
Timber Stand Improvement	49	78
Wildlife	66	64



Minerals: The number of minerals cases arising is not a controllable item, because the Forest is required to respond to cases as they arise. Although a significant number of cases have been completed, many of them have been less complicated than the expected longer-term average. Also, the restrained budgets have decreased the quality of the case workload.

Protection (natural fuels reduction): Budgets have been quite low in this area, and outputs have also lagged over Forest Plan amounts. At this point, it appears that a firm trend is in place and the needs for this work may be different than those projected in the plan. Evaluation will be made after 5 years of implementation are completed.

Range: Both range budgets and production amounts are below that shown in the Plan, but relatively less so for production. It's expected that negative impacts on range conditions could occur if production levels stay relatively higher and budget levels remain low.

Recreation: Compared to the Plan, recreation budgets are lower and outputs are 40% higher. Continuing difficulty in obtaining full funding on a National basis affects this program area. Outputs, however, are steadily increasing as more people opt for recreational activities on National Forests. The Forest is fortunate to have the assistance of volunteers and challenge grants which helps to reduce the gap between planned and realized funding. Recreation experience quality may diminish if the current co-operation diminishes and the budget gap continues.

Reforestation: Reforestation budget and achievement levels are almost at par with those indicated in the Plan. The level of activity is lower than expected in co-operative reforestation work by timber purchasers because of the recession in the timber industry (see Appendix A). Since unit costs are remaining similar to those projected, total reforestation costs are also lower than expected proportionate to the reduced workload.

Timber: Both timber budgets and outputs are less than planned, but indicate a strong direct relationship. As discussed elsewhere in this report (see Monitoring Item E-1), there are several reasons why planned timber sell amounts have not been achieved.

Timber Stand Improvement: Actual costs for pre-commercial thinning for the first four years of the Plan have been less than those anticipated. Acreage thinned has not fully reached planned levels, but due to normal variations in program activity, may approach planned amounts in future years as more stands grow into overstocked conditions or more stands become accessible.

Wildlife and Fish: Cumulative budgets and output levels are continuing to be low, but as can been seen in Table H-4-1, there is a strong trend in place reflecting a substantial increase in budgets. As can be seen, in FY 88 the Forest received about a third of the Forest Plan budget amount for Wildlife and Fish (funding item 10), while for FY 91, it received 70%. It is anticipated that this trend will continue, as local and national emphasis is changing to increase wildlife and fish programs. Continuing efforts, such as the challenge cost share program, and volunteer efforts are expected to add to both budget and output levels.

PROTECTION

Insect & Disease Status as a Result of Activities: Monitoring Item P-1

ACTION OR EFFECT TO BE MEASURED AND PURPOSE:	Determine the level of insect and disease organisms following management activities to insure the health of residual and surrounding stands.
REPORTING FREQUENCY:	Every two years (1989, '91, '93, '95, '97)
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Insect and disease levels increase beyond normal levels.

Background: The mountain pine beetle (Dendroctonus ponderosa Hopkins) throughout the Forest was the significant insect concern during 1988-91. All other insects and diseases remained at endemic (low) levels.

The mountain pine beetle (MPB) was first observed at an epidemic population level in 1972, in the Upper Yaak River drainage in the northwest corner of the Forest. The timber stands being infected were primarily lodgepole pine (LPP). Since then, MPB has spread Forestwide and has also attacked stands of ponderosa pine, whitebark pine and white pine.

Results: During fiscal years 1989-1990, the Kootenai Forest experienced the highest amount of MPB-infested acreage in the State of Montana. The MPB continues to spread into susceptible stands of LPP, causing high mortality rates in mature trees. Although the MPB population peaked in 1985 with approximately 377,000 acres infested (and is currently in a state of decline with an estimated 312,000 acres attacked in 1988, 279,000 acres in 1989, 145,000 acres in 1990 and 46,000 in 1991) the acreage infected is still significant and especially damaging in six drainages located on the Three Rivers and Rexford Ranger Districts (Basin, Porcupine, Young and Big Creeks, and the East and South Forks of the Yaak River).

This insect-infested acreage has been prioritized during fiscal years 1988-91 for timber harvesting within the standards and guidelines of the Forest Plan. The emphasis has been on the harvest of timber stands that are infected, or are at high risk of being infected.

Evaluation: Since live LPP, the preferred MPB food source, has been substantially reduced, the beetle has shifted some of its recent attacks to ponderosa pine stands (pole and mature sawtimber). While significant in relation to the individual ponderosa pine stands, only 6,000 acres were attacked in 1988, 10,600 acres in 1989, 2,200 acres in 1990 and 900 in 1991. Regional Entomologists state that the ponderosa pine stands will not support the epidemic MPB populations experienced in LPP stands.

The strong winds experienced in October of 1991 could have a significant effect on future insect activity, especially Douglas-fir and spruce bark beetles, if prompt salvage is not initiated. Current estimations are that about 100,000 acres are affected on the Three Rivers, Libby and Rexford Ranger Districts.

APPENDIX A

KOOTENAI NATIONAL FOREST
PLANNED OUTPUTS or ACTIVITIES, and ACCOMPLISHMENTS by FISCAL YEAR
(Reference Used: Table II-1, page II-13 in Forest Plan.)

			PLANNED UNITS[1]	ACTUAL UNITS ACCOMPLISHED BY FISCAL YEAR (FY)					
TARGET ITEM	OUTPUT or ACTIVITY	UNIT of MEASURE	FISCAL YEARS 1988-92	FY 88	FY 89	FY 90	FY 91	Average Units Per Year	Percent of Planned Units
RECREATION	Developed Use	M RVD	297	318	273	200	300	273	92
	Dispersed Use								
	Wilderness	M RVD	18	35	17	30	25	27	149
	Non-wilderness	M RVD	559	797	900	866	1088	913	163
WILDLIFE & FISH	Wildlife Habitat Improvement	M Acres	5.6	3.0	5.1	3.1	3.1	3.6	64
	T & E Habitat Improvement	Acres	150	405	0	0	0	101	68
	Fish Habitat Improvement	Acres	120	276	137	62	28	126	105
RANGE	Permitted Grazing Use	M AUM	12.6	11.6	10.3	11.7	11.9	11.4	90
SOIL	Soil Inventory	M Acres	15.7	1.0	1.0	20.0	5.0	6.8	43
LANDS	Land Exchange	M Acres	1.7	5.8	3.3	0.3	1.0	2.6	153
MINERALS	Minerals Management	Cases	300	220	312	226	219	244	81
PROTECTION	Fuels Treatment, Natural	Acres	800	621	583	798	925	732	92
TIMBER	Total Volume Offered (Sold)	MMBF	233[2]	175	185	148	120	157	67
	Reforestation - Appropriated	M Acres	3.0	2.3	3.1	2.9	4.2	3.1	104
	Reforestation - KV[7]	M Acres	7.1	5.0	6.4	8.5	9.4	7.3	103
	Reforestation - Other (Co-op.)	M Acres	4.0[3]	4.2	3.2	3.0	1.4	3.0	75
	Timber Stand Impr. - Approp.	M Acres	4.0[4]	3.4	4.0	3.0	2.2	3.2	79
	Timber Stand Impr. - KV	M Acres	1.0[4]	0.5	0.7	1.0	0.7	0.7	70
	Stand Examination	M Acres	139	171	208	197	141	179	129
	Fuel Treatment - BD/KV	M Acres	11.7	11.7	14.5	12.0	11.1	12.3	105
FACILITIES[5]	Total Road Construction[6]	Miles	237	94	107	112	45	90	38
	Trail Construction/Reconstr.	Miles	7.5	6.0	6.0	1.0	9.3	5.6	74

[1] Average Annual Units.

[2] Includes 25 MMBF/year of non-interchangeable volume (primarily dead lodgepole pine) plus 202 MMBF of live green timber for an ASQ of 227 MMBF/year. In addition to the ASQ, 6 MMBF/year of unregulated volume is expected to be offered.

[3] Acres planted/seeded and site preparation for natural regeneration as part of the timber sale contract (purchasers requirement) and other contributed funds.

[4] Includes precommercial thinning and release.

[5] Road reconstruction has been dropped from this Table because of inconsistencies found in the data during the last four years. This item will be re-calculated at the 5-year review next year (FY 93).

[6] Arterial/Collector and Local roads have now been combined into one group to coincide with current road engineering recordkeeping.

[7] Reforestation-KV has now been separated into two groups (KV & Other) to coincide with current silviculture recordkeeping.

APPENDIX B

Timber Sell Volume: Monitoring Item E-1

The following Table shows actual accomplishments in relationship to the Forest Plan:

Table APP.-B-1

SUITABLE LANDS

	Forest Plan[1]	FY 88	FY 89	FY 90	FY 91	Total FY 88-91	Avg. Per Year	4-Year Volume Diff.	Percent Difference
Unit of Measure > >	MMBF	MMBF	MMBF	MMBF	MMBF	MMBF	MMBF	MMBF	PERCENT
ASQ:									
Regulated	202	152.4	152.8	115.4	92.4	513.0	128.3	-295.0	-36.5%
Non-interchangeable									
Dead LPP	20	19.2	25.9	26.4	18.7	90.2	22.6	10.2	12.8%
Other Dead	5	1.7	2.3	4.5	3.1	11.6	2.9	-8.4	-42.0%
Total Non-interchangeable	25	20.9	28.2	30.9	21.8	101.8	25.5	1.8	1.8%
Total ASQ	227	173.3	181.0	146.3	114.2	614.8	153.7	-293.2	-32.3%
Non-chargeable[2]									
Roundwood	0	0.9	0.7	0.8	2.3	4.7	1.2	N/A	N/A
Fuelwood	0	2.4	3.2	2.1	2.4	10.1	2.5	N/A	N/A
Total Non-chargeable	0	3.3	3.9	2.9	4.7	14.8	3.7	N/A	N/A

UNSUITABLE LANDS

All Unregulated	6	2.4	3.4	2.2	1.4	9.4	2.4	-14.6	-60.8%

[1] Average Annual Outputs

[2] Woody material that is sold, but not accounted for in Appendix 11 of the Forest Plan. Roundwood is small material not meeting Region One forest planning sawlog specifications and usually removed as post, pole, or rail products.

NOTE: Totals may not be exact because of rounding.

APPENDIX B

Harvest Area Size: Monitoring Item E-8

Table APP.-B-2

Timber Harvest Units Resulting in Openings of Greater Than 40 Acres

Fiscal Year	Management Area	Timber Sale Name[1]	Harvest Unit Size in Acres	Years Needed Until No Longer Considered to be an Opening
1990	16	Lower Gold	52 116	15 15
1990	15/16	Upper Gold	132 95	15 15
1990	16	South Parsnip	105 85	15 15
1990	16	Middlefork	158 55 44 68	15 15 15 15
1990	16	Parsnip Ridge (1)	59	15
1990	16	Doyle Gulch	41 49 70	15 15 15
1990	15	Kit (1)	18[2]	10-12
1990	12	Beatle Pk (3)	44[2]	10-12
1990	15	Beaver Bt (2)	22[2]	10-12
1990	15	Beavertail (7)	134[2]	15
1990	15	Beavertop (2)	43[2]	15
1990	15	Silver Ridge (6)	137[2]	15
1990	12	Silver Ridge (1)	15[2]	10-12
1990	12	Sheep Mountain (3)	97[2]	15
1990	15	Bear Flat (1)	211	15
1990	12	Bayou Mtn (2)	13[2]	10-12
1990	15	Swamp Marsh (3)	79[2]	15
1990	12	Rocky 5 Mile (1)	23[2]	10-12
1990	12	Lakeview (1)	17[2]	10-12
1990	15	Silver Pony (3)	96[2]	15
1990	15	Park Creek (1)	28[2]	10-12
1990	15	Grimm Again (1)	5[2]	10-12

Timber Harvest Units Resulting in Openings of Greater Than 40 Acres (continued)

Fiscal Year	Management Area	Timber Sale Name[1]	Harvest Unit Size in Acres	Years Needed Until No Longer Considered to be an Opening
1990	12	Stenerson Sd (5)	74[2]	15
1990	12	Swamp Ridge (7)	186[2]	15
1990	15	Swamp Ridge (7)	130[2]	15
1990	15	Sterling Ridge (2)	67[2]	15
1990	15	Swamp Peak (1)	34[2]	10-15
1990	11	Castle (2)	95	15
1990	12	Pony Mtn Burn (1)	52	15
1990	15	Cody Alder	42 43	15 15
1991	15	Boof Blowdown (2)	49[2]	10

[1] The number inside the bracket ( ) is the number of harvest units involved.

[2] The harvest unit acreage(s) shown are adjacent to existing opening(s) causing the combined opening size(s) to be greater than 40 acres.

APPENDIX C

SOURCES FOR INFORMATION

For information about the Forest Plan and this monitoring report, contact the following offices:

Kootenai National Forest
Supervisor's Office
506 U.S. Hwy 2 West
Libby, MT 59923
406-293-6211

Kootenai National Forest
Rexford Ranger District
1299 Hwy 93 N
Eureka, MT 59917
406-296-2536

Kootenai National Forest
Fortine Ranger District
PO Box 116
Fortine, MT 59918
406-822-4451

Kootenai National Forest
Three Rivers Ranger District
1437 North Highway 2
Troy, MT 59935
406-295-4693

Kootenai National Forest
Libby Ranger District
1263 Highway 37
Libby, MT 59923
406-293-8861

Kootenai National Forest
Fisher River Ranger District
12557 Highway 37
Libby, MT 59923
406-293-7773

Kootenai National Forest
Cabinet Ranger District
2693 Highway 200
Trout Creek, MT 59874
406-827-3533