

Forest Plan Monitoring Report for Fiscal Year 1992 Including a Summary of the Last Five Years

February 1993

Kootenai National Forest Plan

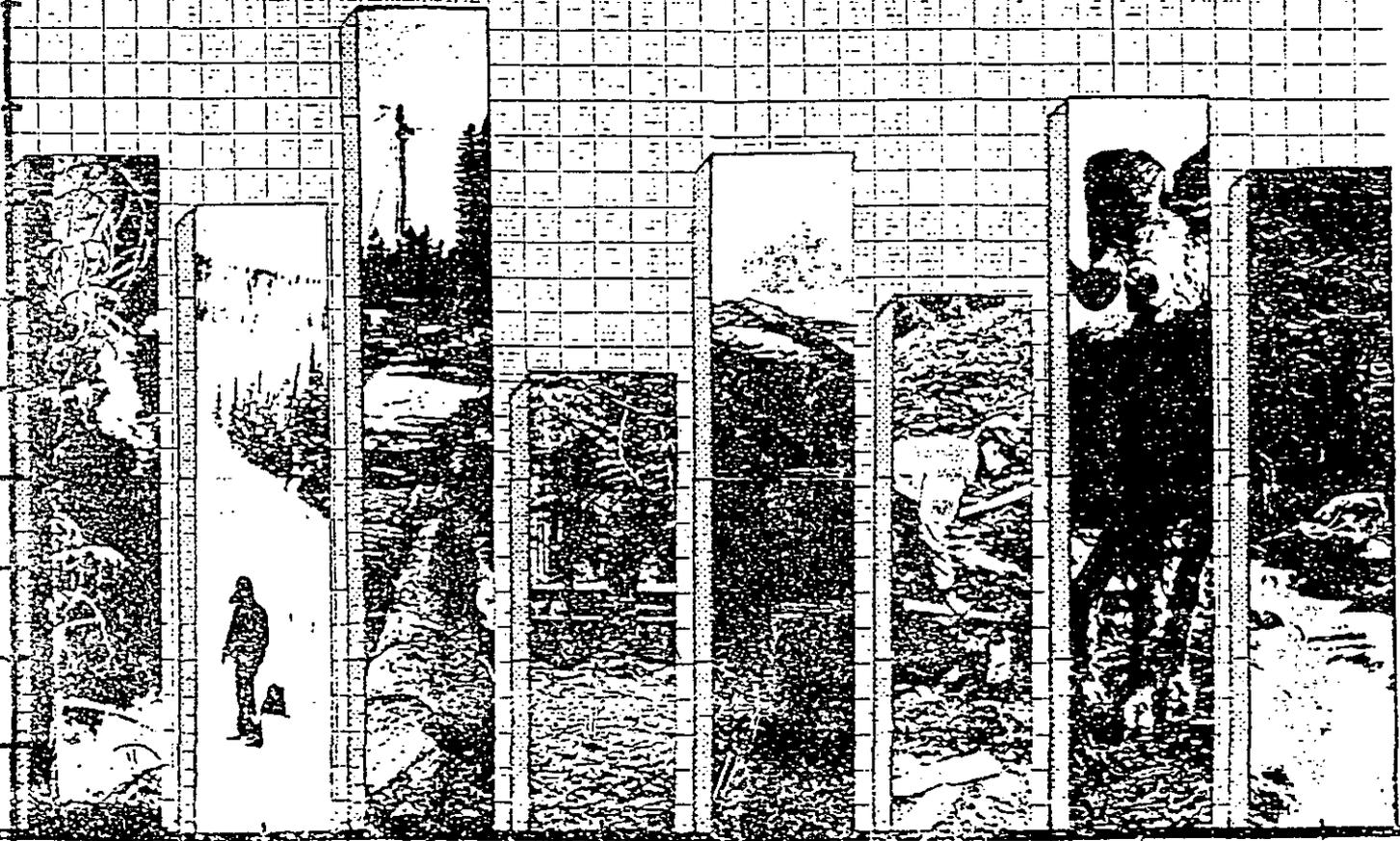
United States
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Forest Service

Kootenai
National Forest

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United States
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Agriculture

Forest
Service

Kootenai
National
Forest

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Date: February 26, 1993

Dear Forest Planning Participant:

Enclosed is the Kootenai Forest Plan Monitoring Report for fiscal year 1992. It shows how we're 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 five years.

The results show that Forest Plan implementation is progressing well in many areas, is uncertain due to incomplete results in some areas, and is not meeting expectations in 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 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.

This is the fifth year or halfway point in the 10-year Forest Plan period. Immediately after the publishing of this 5th-Year Report, we'll begin our evaluation of the results and present some recommendations to the Regional Forester for his consideration. This 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 at the back of this report), or Paul Leimbach at the Forest Supervisor's Office in Libby.

ROBERT L. SCHRENK
Forest Supervisor



Forest Plan Monitoring Report for Fiscal Year 1992

**Kootenai National Forest
February, 1993**

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¹ Originally Monitoring Item C-3. ² This has been merged with other Wildlife Monitoring items.

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Forest Plan Annual Monitoring Report for Fiscal Year 1992

Kootenai National Forest
February, 1993

INTRODUCTION

We've recently completed the monitoring of Forest Plan implementation for fiscal year 1992. This was the 5th year of operation under the Plan and includes the period from October 1, 1991 to September 30, 1992.

Background: The Forest Plan for the Kootenai Forest was approved on September 14, 1987. It established management direction 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 and environmental effects along with a balancing-of a myriad of legal requirements.

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

Process: At the end of the 5th year, we're still mostly concerned with implementation and effectiveness monitoring but validation concerns are now raising important questions. The Plan's guidance for monitoring and evaluation 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 determine if implementation is within the prescribed range of variability. If an item is not within the prescribed range, an evaluation is undertaken to find the reason for the deviation. When the reason is determined, the Forest can then take the needed steps to correct the deviation.

As indicated in Chapter IV of the Plan, there are 39 items to be measured on a yearly basis. Of these, one item was dropped because of duplication (C-8) and another was split for consistency with the other Wildlife items (C-3.) Of these 39 remaining 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 5th-year report discusses all 39 items. In addition, the Regional Forester assigned an additional monitoring item in 1991 (E-9). This annual-reporting item, also included in this report, brings the total monitoring items to 40.

Procedure: For each of the 40 monitoring items, we first checked to see if it was within the prescribed range of variability. If it was, then we concluded there was compliance with the Plan. In some cases, we found that we could currently be close to the prescribed range and the 5-year trend indicates that the expected level will be met by October 1, 1997. For these items, we concluded that the monitoring item was on-track and meeting the Plan's intent. Finally, there are monitoring items that we found are not currently within or close to the prescribed range, and the trend indicates that the expected level will not be met. For these items, we concluded that the monitoring item is out of compliance or off-track with the Plan's intent and we'll make a determination of what to do to correct them. The information that we've gained from the monitoring displayed in this Report will be used to help us make these determinations. They'll be completed by March 15, 1994 and will constitute the formal 5-year review and evaluation of the Plan. This upcoming 5-year Review and Evaluation Report will discuss what changes are needed in the Plan and why they are needed. It will discuss how and when these changes will be implemented. All of these changes must be approved by the Regional Forester.

SUMMARY OF THE LAST 5 YEARS (Fiscal Years 1988-1992)

When we answer the question "Did we do what the Plan said we should do?", we find adequate information to say YES for 21 monitoring items because we're within the Plan's prescribed range or ON-TRACK because we're close and moving toward the prescribed range. For another 9 items, we find adequate information to say NO because we're outside the Plan's prescribed range or OFF-TRACK because we're close but moving away from the prescribed range. For 9 other items we have Inadequate results to draw any supportable conclusions (inconclusive). One final 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 close and ON-TRACK moving toward that compliance, include: Roadless Area Use, Visual Quality Objectives (VQO's), Developed Site Use, Roadless Area Changes, Cultural Resource Management, Elk Habitat, Elk Populations, Other Big-Game Habitat, Other Big-Game Populations, Old-Growth Habitat, Threatened and Endangered (T & E) Species Habitat, Range Use, Timber Growth Trends, Reforestation, Timber Stand Improvement, Harvest Area Size, Clearcut Acres Sold, Mineral Activity Effects, Road Access Management, Road Density, and Insect and Disease Status. This is what we found for these items:

Roadless Area Use (A-1): During the last 5 years, the average annual recreation use on all 34 roadless areas combined has been less than projected but still within the range prescribed in the Plan. This includes the 32 inventoried roadless areas, one wilderness study area and one designated wilderness. A comparison of the monitoring data shows that the average use in the wilderness is above the prescribed range. In fact, the average use in the wilderness is almost the same as the total average use in the 33 other roadless areas combined, even though there's four times more total acreage available in these other roadless areas. This heavier-than-projected use indicates we may be experiencing more than the expected resource damage in the wilderness (see Roadless Area Overuse, Item A-2). Therefore, we'll evaluate the wilderness use further during our 5-year review.

Visual Quality Objectives (VQO's) (A-3): After five years, about 3% of the total acres monitored did not meet the prescribed VQO's, but this is within the 10% range stated in the Plan. The primary reasons for not meeting the prescribed VQO's were timber harvesting in fire-killed stands and in dead and dying lodgepole pine stands that were infested with mountain pine beetle. This type of harvesting (mostly clearcutting and seedtree cutting) provides limited opportunities for leaving vegetative screening, or to shape and blend harvest-unit edges into the adjacent stands. Although this monitoring item is technically within the specified limits stated in the Plan, other informal monitoring information indicates that some further evaluation is warranted during the 5-year review.

Developed Site Use (A-4): The annual recreation use of all the campgrounds, picnic grounds, etc., has been on an upward trend since FY 1990. If this trend continues at its current rate, the use should be within the range specified in the Plan in FY 1993.

Roadless Area Changes (A-6): About 4,480 acres of the 400,000 total inventoried roadless acres (IRA's) on the Forest have been developed by timber sales during the last five years. This is within 85% of the 5,250 acres estimated in the Forest Plan EIS. This acreage, plus the portions of IRA's developed prior to the Plan's approval, total 10,500 acres of change. This is 3% of the total IRA's, which leaves 97% of the IRA's intact (389,000 acres) of which 84% are not available for development (334,000 acres) during the life of the Plan.

Cultural Resource Management (A-7): The annual accomplishment in consultation with the State Historic Preservation Office (SHPO) ranged from 73% in FY 1988 to 99% in FY 1992. The average annual accomplishment for the last five years is 88% which is close to the 90% level prescribed in the Plan.

Elk Habitat (C-1): There's 1,300,000 acres of elk summer range on the Kootenai Forest, and during the last five years, 472,000 acres (36%) were evaluated. Based on this amount of analysis, about 60% of the elk summer range is in a condition of improving habitat effectiveness (HE) and another 29% is maintaining

the existing HE. The remaining 11% is in a declining HE. Most of the improvement in elk HE is probably a result of the increased amount of road closures implemented during the last five years (see Monitoring Item L-1, Road Access Management).

Elk Population (C-2): Elk numbers have increased on the Forest during the last five years, and one reason may be the increase in the amount of road closures that have been directed by the Plan. Changes in the elk hunting season may have also contributed to the increase. A large factor contributing to this increased elk population may also be the mild winters that have been occurring since the Plan was approved five years ago.

Other Big-Game Habitat (C-3a): Whitetail deer, mule deer, moose, bighorn sheep, black bear and mountain lion habitats appear to be either maintaining or improving. There's some concern whether mountain goat habitat is beginning to develop a downward trend because of the advancing state of the vegetation (from predominantly browse to trees) due to fire control. Further monitoring of goat habitat trends is warranted.

Other Big-Game Populations (C-3b): Whitetail deer, moose, bighorn sheep, mountain goat and mountain lion populations appear to be either stable or increasing. There's some concern whether the mule deer population is beginning to develop a downward trend after a lengthy increase, and the black bear population may be stabilizing or beginning to increase after a long downward trend. Further monitoring of these trends is warranted.

Old-Growth Habitat (C-5): is necessary to support viable populations of dependent wildlife species. The Forest Plan requires that 10% of the land area below 5,500 feet elevation be protected to provide this habitat. This is a commitment of 186,500 acres Forestwide. As we proceed with site-specific project planning, we're checking the quantity and quality of old-growth habitat before any projects are implemented. After five years, we've completed the necessary surveys on over 817,000 acres. The results show we've protected almost 92,000 acres of old-growth habitat on this surveyed acreage. This is 49% of our forestwide commitment of 186,500 acres.

T & E Species Habitat (C-7): 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 or trends. We haven't observed any peregrine falcons in FY 1992, 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 from endangered to threatened in the near future. Our information also displays that grizzly bear habitat effectiveness is above the Plan's standard on a Forestwide average. Overall, the quantity and quality of habitat for all these species is being improved or maintained, and we're progressing toward providing habitat needed for recovery.

Range Use (D-1): which is cattle grazing has been averaging 11,400 animal unit months (AUM's) per year. This is about 10% less than the projected 12,600 AUM's but still within the prescribed range stated in the Plan (+/- 20%).

Timber Growth Trends (E-4) The measurements done on the sampled plots show that the Forest Plan Timber Yield Tables are still reasonable for even-aged management. The permanent growth plots remeasured show that the sampled stands are still within the parameters established for their age. In fact, the height measurements are exceeding the projections by 10%.

Reforestation (E-5): The average annual accomplishment is 13,100 acres per year. This is about 93% of the Plan's goal of 14,100 acres and within the range specified in the Plan (+/- 10%). The average failure rate of 4% is also within the Plan's limit of 10%.

Timber Stand Improvement (TSI) (E-6): The annual accomplishments over the last five years have been variable and ranged from about 2,900 to 4,800 acres. The 5-year average is 4,100 acres per year which is within the prescribed range of 4,000 to 6,000 acres per year.

Harvest Area Size (E-8): The Forest Plan provides standards for the maximum size of regeneration harvest units using the clearcut, seedtree, or shelterwood cutting methods. The standard is generally 40 acres maximum, except in big-game winter range which is usually 20 acres. After five years, all suitable timber management areas are within the prescribed limits. The only exceptions are where catastrophic events occurred such as insects, fire or blowdown. Where these situations occurred, procedures to deviate from the prescribed size-limits were followed, including an interdisciplinary review and notification of the public.

Clearcut Acres Sold (E-9): Because of the national concern for the amount of clearcutting on the National Forests, Congress has directed that clearcutting be reduced by 25% by 1995. The Chief of the Forest Service has further directed that it be reduced by 70% by 1997. The results indicate that, by FY 1992, the amount of clearcut acres sold for harvest has decreased 38% since FY 1988, the baseline year used for comparison.

Mineral Activity Effects (G-1): There have been no Management Area (MA) changes required as a result of mineral development activity during the last five years. Currently, Noranda's Montanore Mine proposal is being evaluated in an EIS. This project would involve 1,370 acres, if approved, and any MA changes needed would be within the projections outlined in the Plan.

Road Access Management (L-1): Restrictions on the use of some Forest roads are necessary at different times of the year and in some locations, yearlong. This is because of the need to provide for big-game security in both winter and summer range, reduce road maintenance costs, reduce soil erosion from roads, and provide for grizzly bear recovery. The miles of road needing some sort of restriction has increased steadily from 1,669 miles, just prior to the Plan's approval in 1987 to 3,784 miles in FY 1992. This is an increase from 27% of the total road miles to 53% and is on-track with the Plan's projection of 57% at the end of 10 years. This monitoring item has identified an incorrect assumption that about 4,530 miles of general public access would remain unrestricted throughout the Plan period. Currently, 3,365 miles are unrestricted.

Road Densities (L-2): The projected final road densities used in the FORPLAN computer model ranged from 4.4 to 5.8 miles per square mile in the suitable timberland. (The suitable timberland is where road construction is needed to provide access for timber harvest.) These densities were calculated from actual experience during the 1970's. After five years, the actual road densities measured on 886,000 acres are 39% less than projected (3.2 miles per square mile actual average versus 5.1 miles per square mile projected average). This is on-track with the Forest Goal of building the least amount of roads possible to manage the Forest. There's some concern about how much the reduced amount of total road construction is contributing to this lower road-density being experienced (see Appendix A). This item will be further evaluated during the 5-year review.

Insect and Disease Status as a Result of Activities (P-1): We've used aerial reconnaissance and individual timber stand analyses 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 and road construction. Although a significant amount of acreage is affected by insects and disease, no evidence suggests that any of the management activities are contributing to this situation. In fact, activities appear to produce beneficial results in terms of health of timber stands.

The monitoring items where we answered 'NO we're out of compliance with the Forest Plan', or we're close but OFF-TRACK 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, Water Yield Increases, Soil Productivity, Forest Plan Costs, and Forest Plan Budget Levels. This is what we found for these items:

Timber Sell Volume (E-1): The Forest's allowable sale quantity (ASQ 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 ASQ would be 227 MMBF per year for a 10-year period. For the first five years of the Plan, the average annual timber sell has been 159 MMBF per year or 30% below the projected upper

limit (ASQ). This deviation has been the result of a court injunction against road construction and timber harvest in the Upper Yaak River valley, harvest deferrals to meet watershed standards in drainages containing private lands, and other reasons such as the clarification in the management of grizzly bear habitat in the Cabinet-Yaak Ecosystem. The cumulative difference resulting from these and other factors totals 342 MMBF for the first five years of the Plan. Trends appear to be firmly in-place which will not allow for this difference to be made up in the next five years. At the current rate of separation between the average annual sell and the ASQ, the Forest will have a cumulative difference of 684 MMBF at the end of the 10-year Plan period on September 30, 1997. An evaluation of this cumulative difference will be made during the 5-Year Review.

Acres Sold for Timber Harvest (E-2): The total acres sold for regeneration harvest is 43% below the planned level. This difference results from the same factors affecting timber sell volume and confirms the downward trend (see Item E-1, above).

Suitable Timber Management Area (MA) Changes (E-3): The Forest Plan allows for minor corrections in the boundaries of management areas based upon site-specific analysis and interdisciplinary review. However, any significant cumulative net changes could affect the ability of the Forest to produce particular outputs. After five years, the decrease in MA-11 (Big-Game Winter Range in Suitable Timber) and MA-15 (Timber Production) are over 10,000 acres each which is outside the Plan's prescribed range of +/- 5,000 acres. The total net change of suitable timberland since October, 1987 has been a decrease of over 29,000 acres. The effect of this net change will be evaluated during the 5-year review.

Timber Harvest Deferrals (E-7): Acres of suitable timber can be deferred from timber sales due to economics, resource conflicts or other unforeseen reasons such as lawsuits including court injunctions. During the 5-year monitoring period, many different events or situations caused deferrals and one management area (MA-12) has deferrals large enough to initiate further evaluation (10,000 acres). The FY 1992 situations that deferred suitable timber acreage from sale proposals include timber sale design adjustments to meet wildlife security/displacement/hiding cover needs, old-growth habitat replacement, and stands destroyed by fires.

Soil and Water Conservation Practices (F-1): In FY 1992, we achieved 93% in the implementation of Best Management Practices (BMP's) and 86% for BMP effectiveness. This is a decline of 3-5 percentage points, respectively, from FY 1990. This is below our goal of 100% compliance with the State water quality guidelines, and indicates the need for more on-the-ground training for field personnel responsible for ensuring that these conservation practices are incorporated whenever and wherever needed, and that they are done properly.

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 51% 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.) The current situation is that 26% of the surveyed areas exceed the water yield guidelines according to the model. This is outside the 20% level prescribed in the Plan. Whenever the water yield guideline is projected to be exceeded in an area, planned activities on the National Forest lands have been deferred until watershed recovery occurs (or in the case of a wildfire, an exception to proceed is granted by the State of Montana). This has been necessary to meet the Forest Plan standard and protect downstream beneficial uses as required by the Montana State water quality goals. The effect of this large amount of land being beyond the water yield limits will be analyzed during the 5-year review.

Soil Productivity (F-4): The proposed Regional standard for significant soil disturbance is that no more than 15% of an area should be significantly disturbed after all activities have occurred such as skidding, slash piling, etc.. The survey results completed on 511 acres indicate that 52% of the acreage surveyed exceeded the 15% disturbance standard. Most of these areas where the 15% standard was exceeded were in locations where tractor logging and associated machine piling of slash was required. In contrast, the areas where cable logging and broadcast burning were used were within the 15% standard. These results indicate a need for further evaluation during the 5-year review.

Forest Plan Costs (H-3): Timber Sales costs have increased +41% over the last five years. This is because of the increased complexity in timber sale preparation, but the 30% reduction in timber sell volume has also contributed.

Forest Plan Budget Levels (H-4): For the last five years, the average Forest budget has been less than estimated in the Forest Plan (72% of the planned level), but the trend has been moving upward. The lower average budget level 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 achieving budgets that are more in line with the original estimations (81% average of the planned level during the last two years). The FY 92 budget was the closest to the Plan's estimation (84% of the Forest Plan level), and it now seems to be more in line with what can be achieved based on the overall Forest monitoring results.

The monitoring items where we have inadequate results to support reasonable conclusions include: **Roadless Area Overuse, Off-Road Vehicle (ORV) Use Effects, Old-Growth Habitat Species, Cavity Nesters, Riparian Areas, Fisheries, Noxious Weed Infestations, Stream Sedimentation and Effects on the Local Economy.** These items were not monitored to a level sufficient to make firm determinations of whether or not they're within the Plan's prescribed range, or moving toward or away from that range. Because of the lack of sampling or baseline data, these monitoring items will be further evaluated during the 5-year review to determine if any changes are needed in the monitoring plan to improve the future reporting.

Roadless Area Overuse (A-2): Some vegetative damage has been observed from overuse at popular campsites or where people become concentrated because of steep topography. Most of these observations have been in the Cabinet Mountain Wilderness and the Ten Lakes Wilderness Study Area; two popular and easily-accessible areas. Remedies are being applied to mitigate the observed damage.

ORV Use Effects (A-5): Some disturbance has been observed in the open bench area below the high-waterline of Lake Koocanusa near Tobacco Plains. No other significant effects have been reported although some disturbance to big-game in some winter range areas is suspected and some damage to closed roads has been observed (destroying earthen barriers).

Old-Growth Habitat Species (C-4): No known surveys were undertaken during the last five years.

Cavity Nesters (C-6): Information obtained through Forest Plan monitoring and a special survey indicate a wide variance in the amount of cavity habitat being retained. A few drainages are now below the Forest standard of 40% cavity habitat potential because of timber harvest operations that pre-dated the Plan's approval. The remaining drainages appear to be above the Forest standard, but snag-retention objectives are often not achieved on a site-specific basis where timber harvest occurs.

Riparian Areas (C-9): The two indicators used to assess riparian area protection are the miles of streams mapped in the suitable timberland, and the achievement level obtained in riparian area Best Management Practices (BMP's). We've completed the mapping on almost 2,200 miles of streams which is about 8% of the 28,000 miles estimated to need mapping on the suitable timberland. We've also been achieving about 90% in implementation and 94% in effectiveness for the riparian BMP's. This is still below our goal of 100% achievement.

Fisheries (C-10): Monitoring data for fisheries habitat from 1989-1992 has been gathered from five representative watersheds but the results are inconclusive. Based on fish population surveys done during the last five years, 43 watersheds have now been identified that contain sensitive fish species (such as the bull, interior redband and westslope cutthroat trout, and the torrent and shorthead sculpin).

Noxious Weeds (D-2): Baseline mapping hasn't been completed yet, but progress is being made in the introduction of biological control agents for spotted knapweed in co-operation with the Western Agricultural Research Station and the Lincoln County Weed and Rodent Control Board.

Stream Sedimentation (F-2): Monitoring has been done on seven "forestwide change" indicator streams for the last five years. The results are inconclusive in allowing us to determine if a 20% increase in stream bedload and suspended solids has been surpassed over the natural background conditions.

Effects on the Local Economy (H-1): The Forest Plan EIS projected local economic growth through contributions of increased levels of timber supply to the timber industry, which has been a major factor (70%) of the local 2-County economy. During the last five years, the number of jobs and community income provided by the local timber industry has declined by 16%. Much of this economic decline was due to the national recession, but reduced timber supplies from the Kootenai Forest (-30%) may have also contributed. This reduction in timber volume sold has resulted in a 57% reduction in the available timber volume under contract which may result in higher stumpage prices for the reduced timber supplies remaining on both private and federal lands. This increased stumpage value could contribute to the local economic wealth of the community and offset some of the economic decline resulting from the reduced timber supply.

The monitoring item that doesn't fit into any of the three previous categories is Emerging Issues.

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: Ecosystem Management, adjacent private land activities and their impact on Kootenai Forest programs, air quality, noxious weeds, new T & E Species, and elk vulnerability. The Forest Plan issues that are resisting resolution are: grizzly bear management, state water quality standards, available timber supply, road management and public access, potential mineral development and visual (scenic) quality.

OBSERVATIONS OF SOME FORESTWIDE TRENDS

The results of the last five years of monitoring indicates that a definite trend is now in place. This trend is the cumulative reduced ability to provide the timber harvest opportunities that were projected in the Forest Plan. We've quantified some components of this trend, and will make a determination during the 5-year review currently underway about what adjustments are needed. The 5-year review begins in March, 1993 to 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 Kootenai 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 Kootenai Forest lands to avoid adverse watershed effects. The estimated total land involved is almost 400,000 acres. About 190,000 acres of Kootenai Forest land are affected, which includes over 130,000 acres of suitable timber. During development of the Forest Plan, no allowance was made for such reductions in timber harvest on Kootenai Forest land intermingled with private ownership.

Timber Harvest Deferrals: When timber sales are being planned and designed, a site-specific analysis is done to determine how to best meet Forest Plan objectives. Sometimes all the objectives can't be met, and when this occurs, an adjustment is usually needed in the sale design which defers a previously estimated harvest area to some future time beyond the Plan's 10-year period. In addition to harvest areas deferred to provide for watershed recovery, a number of deferrals have also been made as a result of

appeals and litigation. Over 24,000 acres have now been deferred from timber harvest for these and other reasons during the first half of the Plan's 10-year period.

Suitable Timber Management Area Changes: During site-specific timber sale project analysis, incorrect map boundaries are occasionally discovered that indicate the exact location of an on-the-ground situation needs a map correction. Most of these map corrections 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 original Plan assumption was that most of these map corrections would balance out over the 10-year life of the Plan. The result of all the map changes made over the last five years is a net decrease of 29,000 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: **Wildlife Snag Management, Wildlife Hiding Cover, Grizzly Bear Habitat, Elk Security, and Watershed Condition.** In addition to these functional monitoring items, recent experience in a large portion of the Forest (the Upper Yaak) and the results of a citizen monitoring effort (Inventory Inquiry Project) have helped to illustrate some of these cumulative resource effects.

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 leaf trees are now required to meet standards for replacement snags for cavity nesters and small mammals. The increased number of leaf 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: Experience now 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 sometimes be delayed 5-10 years until the newly-established vegetation becomes dense enough to provide acceptable hiding cover. This longer waiting period has resulted in some deferrals of timber sales beyond the Plan period (1997) and could result in a lower harvest level over the long-term.

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 because of the roughness of the topography and the nearness to other unsuitable timber areas. This assumption is proving true in many cases, but some areas are being discovered where elk security appears to be below an adequate level. Estimates indicate that over 86,000 acres of suitable timber in elk summer range might be involved.

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 an additional 248,000 acres within the standards and guides for grizzly bear management. Of this, 143,000 acres were in suitable timber management areas which had been programmed for harvest at levels higher than acceptable for grizzly bear management.

Timber Inventory Modelling: An analysis done by a citizens' group alleges that an incorrect classification procedure was used in the assignment of timber condition (age) class acreages used in the FORPLAN model. According to the citizens group, a significant amount of acreage should be re-

classified from mature sawtimber to seedlings/saplings. This infers that less mature sawtimber is actually available for harvest than estimated in the Forest Plan.

Watershed Condition Assessment: Because of the concerns being expressed for adequate water quality protection, a preliminary review of over 750 watersheds was recently completed. This review included 2,706,000 acres of both public and private lands within the Forest boundary. The results indicate that about 12% of this total combined acreage is in an unacceptable hydrologic condition and that another 29% is close to, or at, the critical threshold of acceptable hydrologic condition. This suggests that 41% of the total combined Forest area has limitations to further developmental activity in the near future (such as timber harvest and road construction). The amount of suitable timberland involved on the Kootenai Forest with this identified area of watershed limitation is 457,000 acres which is 36% of the total suitable timber (1,263,000 acres).

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. In addition, there's the mature sawtimber inventory question which has also been identified. Since there's overlap between some of these, and effects haven't been quantified yet, it's tentatively estimated that as much as 360,000 acres have probably been affected in some manner. This amounts to over one-quarter (28%) of the total suitable management areas on the Forest. Clearly, this has been affecting the ability of the Forest to provide timber sell levels to eventually reach the Plan's allowable sale quantity. This is reflected in our formal monitoring results which show 57% of planned regeneration harvest acres and a 70% timber sell volume level with indications that this significantly reduced level can be expected to continue (see *Acres Sold for Timber Harvest (E-2)* and *Timber Sell Volume (E-1)*, respectively). The 5-year review will analyze the available monitoring information to determine how these factors interact with achievement of the goals of the Plan. Programmed harvest is only one of the goals, and all of them will be considered interactively.

Summary of the Last Five Years of Forestwide Trends

The results described above for the formal and informal Forest Plan monitoring and the experience obtained from on-the-ground project implementation all seem to indicate the same thing. 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. The magnitude of this reduced level appears to be very significant. The Forest will make a determination about this reduced level of effectiveness and, as part of the evaluation process, provide a recommendation to the Regional Forester for possible adjustments in the Plan.

What's the Next Step?

The 5-Year Review will begin immediately following the publishing of this 5th-year Monitoring Report. The monitoring items that will be analyzed during this review are those that were previously indicated to not be in compliance with the Plan or are outside the range prescribed in the Plan. In addition, the emerging issues (identified in Monitoring Item H-2) will also be assessed to determine what effect, if any, they may be having on the Forest Goals and Objectives. Also, the monitoring items that appeared to be in compliance with the Forest Plan but raised questions concerning particular points, and the monitoring item rated as inconclusive, will be re-analyzed to determine if any changes are needed in the monitoring plan to get a more conclusive determination in future reports.

RECREATION

Roadless Area Use: Monitoring Item A-1

ACTION OR EFFECT TO BE MEASURED:	Determine trends in roadless area use including wilderness and non-wilderness.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 20% of anticipated RVD's by type of use (non-motorized and motorized).

Purpose: This monitoring item was established to test whether appropriate amounts of roadless areas were designated for the using public. There was a concern that too much roadless area was being provided at the expense of other resource uses such as timber production and semi-primitive motorized recreation. The areas being monitored are only those portions of the inventoried roadless areas (IRA's) that are designated to remain roadless during the 10-year life of the Plan (wilderness, recommended wilderness, wilderness study areas, roadless recreation areas, etc.) The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is low.

Background: The Kootenai Forest had 32 IRA's, one wilderness study area, and one designated wilderness when the Plan was approved in September, 1987. The primary non-motorized recreation use in these areas is hiking, fishing, hunting and camping. The primary motorized recreation use is snowmobiling (except within the designated wilderness and four other roadless areas).

The Plan's estimate for total non-motorized recreation use is 65,000 RVD's per year. This includes 18,000 RVD's per year in the wilderness and 47,000 RVD's in the remaining non-wilderness roadless areas. An RVD is the standard recreation-visitor-day of 12 hours use by any combination of people and time. For example: 12 hours use by one person; 6 hours use by two people; 4 hours use by three people, etc., would all equal one RVD.

Results: Tables A-1-1 to A-1-3 display the results of the non-motorized recreation use in designated roadless areas for the last 5 years. This is displayed for the total of both wilderness and non-wilderness as well as separately for each portion. On the average, total roadless area non-motorized use was 53,800 RVD's per year. The average roadless area use in the non-wilderness portion was 28,200 RVD's per year, while the wilderness portion averaged 25,700 RVD's per year.

Evaluation: During the last five years, the total roadless area use (wilderness and non-wilderness areas combined) has been increasing steadily. The average annual use for these combined areas is less than estimated in the Plan although within the prescribed range (see Figure A-1-1). The same increasing trend is observed for recreation use in the non-wilderness roadless areas. The average annual use is less than estimated although the trend is on-track and moving toward the prescribed range (see Figure A-1-2). In contrast, the average use in the wilderness area is higher than the estimated level and has been outside the prescribed range every year (see Figure A-1-3).

It's important to note that the average use in the one wilderness area is almost the same as the average use in the combined 33 other roadless areas (see Tables A-1-2 and A-1-3). This indicates that the use per acre in the wilderness is about four times higher than in the other roadless areas because of the difference in size (94,360 acres of wilderness versus 378,400 acres of recommended wilderness, wilderness study area, roadless designations or limited development options). (Also see Monitoring Item A-6 for more information on roadless area acreages.) With this higher level of use in the wilderness, resource damage to vegetation is more likely to occur in popular areas or where use is concentrated because of steep topography (see Monitoring Item A-2 for more information on resource damage in roadless areas).

The motorized recreation use in the non-wilderness roadless areas averages about 810 RVD's per year which is about 3% of the average use in these areas. This use is also on an upward trend similar to the non-motorized use in both wilderness and non-wilderness areas.

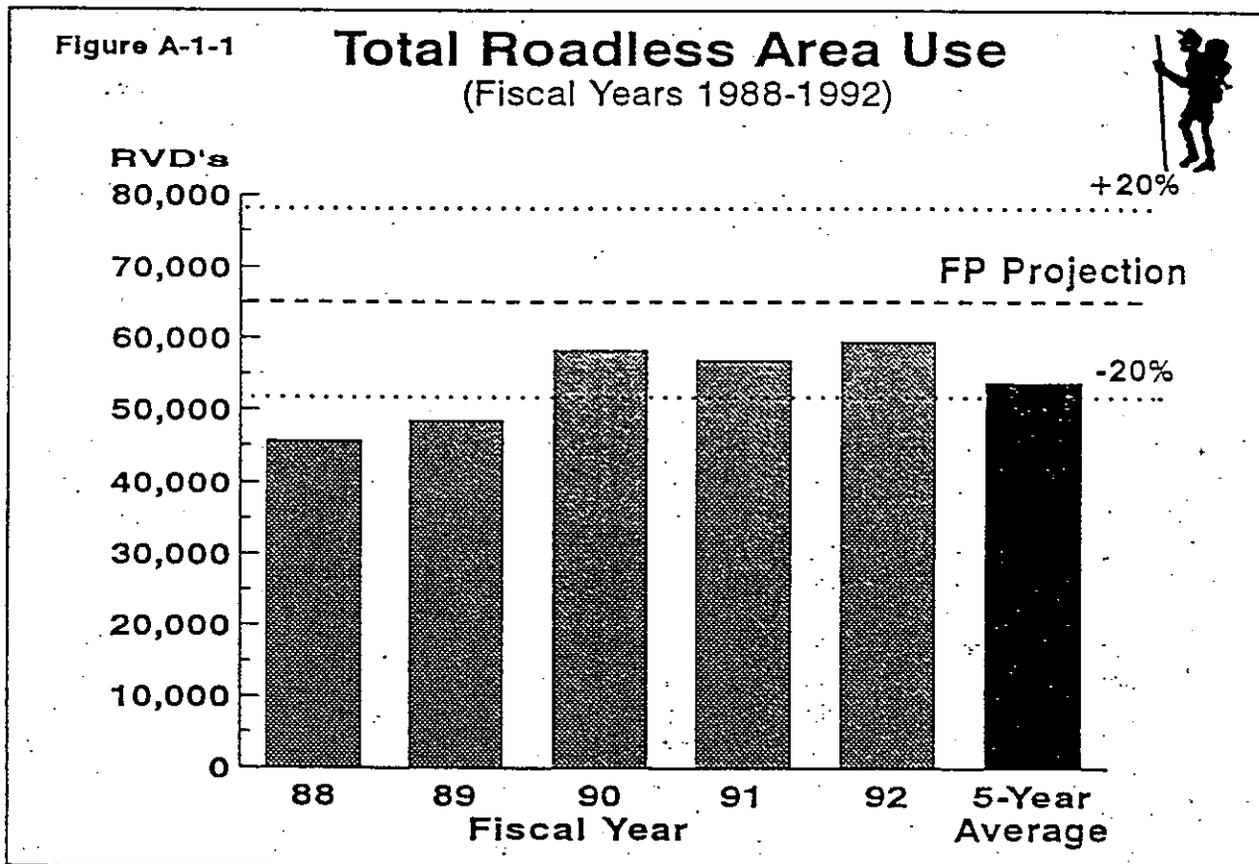
Finding: Overall, this monitoring item is within the prescribed range stated in the Plan (+/- 20%). Some further evaluation will be done regarding the wilderness portion which is outside the +20% range. Although the non-wilderness portion is outside the -20% range, it's premature to initiate further evaluation because the trend is upward and close to the -20% level.

Table A-1-1 Total Roadless Area Use (RVD's)¹

Fiscal Year	Actual Use	Actual Use as a Percent of Estimated Use ²
1988	45,700	70
1989	48,500	75
1990	58,300	90
1991	56,900	87
1992	59,500	92
Average	53,800	83

¹ Non-motorized use only (including wilderness).

² The Forest Plan estimate is 65,000 RVD's per year.



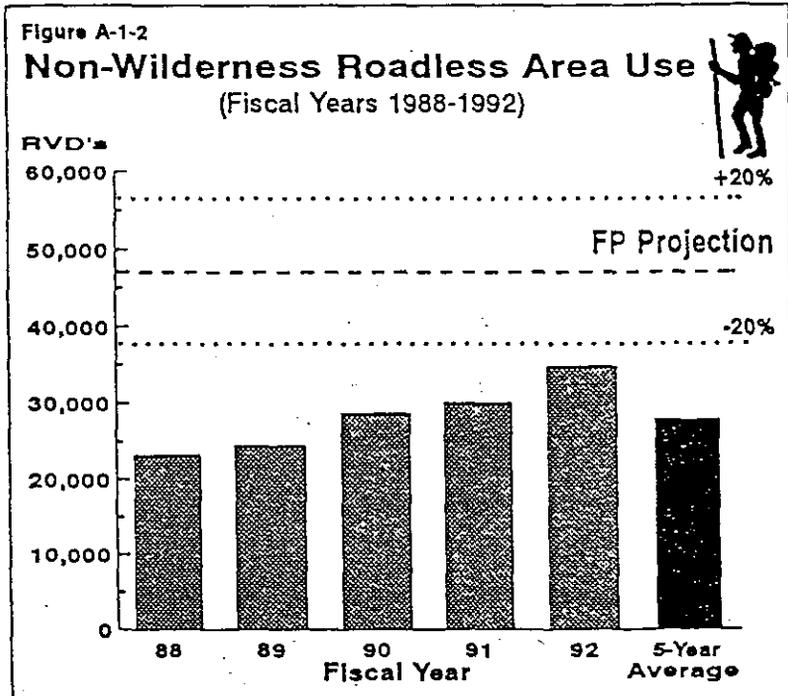


Table A-1-2 Roadless Area Use in Non-Wilderness Areas (RVD's)¹

Fiscal Year	Actual Use	Actual Use as a Percent of Estimated Use ²
1988	23,100	49
1989	24,400	52
1990	28,600	61
1991	30,000	64
1992	34,800	74
Average	28,200	60

¹ Non-motorized use only.

² The Forest Plan estimate is 47,000 RVD's per year.

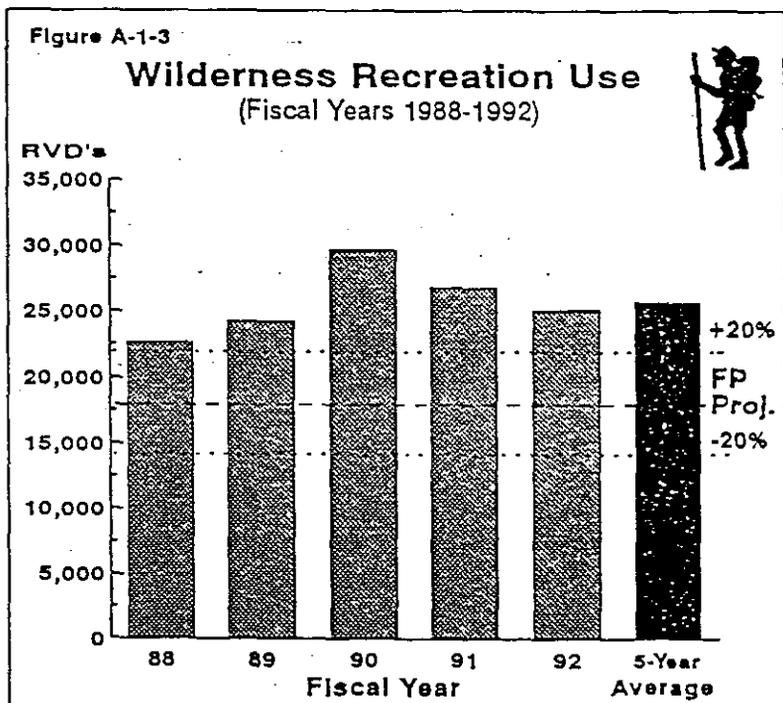


Table A-1-3 Roadless Area Use in Wilderness (RVD's)

Fiscal Year	Actual Use	Actual Use as a Percent of Estimated Use ¹
1988	22,600	126
1989	24,200	134
1990	29,700	165
1991	26,800	149
1992	25,100	139
Average	25,700	143

¹ The Forest Plan estimate is 18,000 RVD's per year.

RECREATION

Roadless Area Overuse: Monitoring Item A-2

ACTION OR EFFECT TO BE MEASURED:	Determine whether roadless areas are being overused, including semi-primitive motorized areas.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Deterioration of site conditions sufficient to damage soil and water resources, permanently affect the sites' ability to recover, become a safety hazard, or detract from the recreation experience.

Purpose: This monitoring item was established to track changes that may be needed in the patterns of use by people and horses in roadless areas. The areas include designated wilderness, recommended wilderness, a wilderness study area, and designated roadless recreation areas. The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is low to moderate.

Background: As stated in Monitoring Item A-1, there is one wilderness area plus 32 inventoried roadless areas and one wilderness study area on the Forest. The yearly use is about evenly split between the wilderness area and the 33 other roadless areas. This even split results in a much higher use per acre within the wilderness because of the difference in total acres (94,360 acres in the wilderness and 378,400 acres of recommended wilderness, wilderness study, roadless and limited development options). (See Monitoring Item A-6 for more detail on roadless area acreages.) Because of this higher use in the wilderness, the potential for overuse and resultant damage is also higher.

Results: During the last five years, some resource damage has been observed in the Cabinet Mountain Wilderness and the Ten Lakes Wilderness Study Area. About five cumulative acres of vegetative damage has occurred from use at various popular and topographically-restricted campsites along several lakeshores in the Cabinet Wilderness. Signing to require minimum setbacks where feasible for campsites along vegetatively-fragile lakeshores is one of the remedies being used to mitigate this type of damage. Horse holding facilities (hitch rail and/or highline) are proposed at several lakes to prevent the girdling of trees and trampling of vegetation. About four cumulative acres of vegetative damage has occurred in the Ten Lakes Wilderness Study Area near Bluebird and Wolverine Lakes including the area in the vicinity of the Wolverine Cabin, a popular campsite. Remedies similar to those applied in the Cabinet Mountain Wilderness have been implemented.

Some damage from use is also occurring in other roadless areas, especially on trails. This damage is resulting from soil movement on trail treads which may be the result of horse and people use, or the lack of full trail maintenance.

Evaluation: Vegetative damage has been reported in the Cabinet Mountain Wilderness and the Ten Lakes Wilderness Study Area due to inappropriate use at popular, fragile campsites. Some mitigation measures have been applied to correct the situation and others are being proposed at numerous sites. These include camping and campfires restrictions, restriction on horse use, and direct site rehabilitation projects.

Finding: The results are inconclusive for this monitoring item because the Plan did not specify any quantitative amounts to compare against (number of acres, miles of trails, etc.).

RECREATION

VQO Effectiveness: Monitoring Item A-3

ACTION OR EFFECT TO BE MEASURED: Determine if the prescribed Forest Plan Visual Quality Objectives (VQO's) are being accomplished.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: +/- 10% of acres treated do not meet the prescribed VQO's.

Purpose: This monitoring item was established to test whether the conflicts between Forest Plan implementation (which is primarily timber harvesting) and the prescribed visual quality objectives are being resolved at an acceptable level. Potential conflicts are mostly anticipated within the suitable timber areas of which about 15,740 acres per year were projected for sale (see Monitoring Item E-2). The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is moderate.

Background: Each management area on the Forest has a prescribed visual quality objective (VQO) to be maintained whenever a timber sale or other developmental projects are proposed. There are exceptions to this requirement when calamities occur such as insect or disease epidemics, large fires, extensive blowdown from severe windstorms, etc. In these instances, the prescribed VQO may not be achievable but an effort is made to obtain the closest compliance possible.

Results: Table A-3-1 displays the results of the last five years of monitoring. A total of 45,231 acres of various projects were reported, most of which were timber sales. Of this total, 1,464 acres did not meet the prescribed VQO. The most common reason for not meeting the VQO was because of timber salvage harvest in fire-killed stands and in mountain pine beetle-killed lodgepole pine stands.

Evaluation: The monitoring information does not show any direct evidence of visual quality problems since the Plan was approved in September, 1987 even though there is localized evidence where the visual quality has been diminished by the harvest of beetle-killed timber.

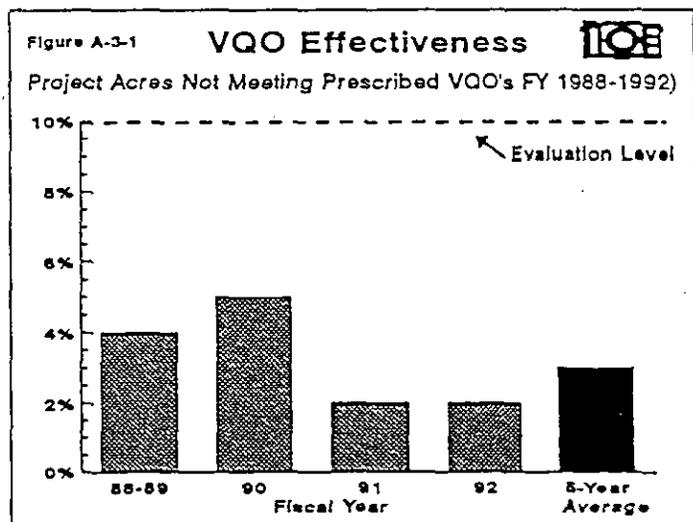
Finding: This item is within the prescribed range stated in the Monitoring Plan (+/-10%) as currently defined. However, there appears to be a need to increase training of personnel doing planning, implementation, and monitoring for visual quality.

Table A-3-1 VQO¹ Effectiveness

Fiscal Year	Total Acres Reported	Acres Not Meeting VQO	Percent Not Meeting VQO ²
88-89	23,679	885	4
1990	5,053	250	5
1991	7,425	179	2
1992	9,074	150	2
Totals	45,231	1,464	ave. 3

¹ Visual Quality Objective.

² The Forest Plan limit for not meeting VQO's is 10%.



RECREATION

Developed Site Use: Monitoring Item A-4

ACTION OR EFFECT TO BE MEASURED:	Determine if the use in developed sites meets Forest Plan projections.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 20% of anticipated RVD's.

Purpose: This monitoring item was established to test whether adequate amounts of developed recreation sites are available for the public. The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is high.

Background: There were about 80 developed recreation use sites when the Plan was approved in September, 1987. Included were campgrounds, picnic areas, boat launching sites, etc. The most popular developed sites are campgrounds and many of the them also contain boat launches.

The Forest Plan estimate for developed site use is 297,000 RVD's per year. An RVD is the standard recreation-visitor-day of 12 hours use by any combination of people and time. For example: 12 hours use by one person; 6 hours use by two people; 4 hours use by three people, etc., would all equal one RVD.

Results: Table A-4-1 displays the developed site use for the last five years. The annual use ranges from 162,000 RVD's in FY 1989 to 225,000 RVD's in FY 1992. The average use is 192,000 RVD's for the five-year period.

Evaluation: The annual developed site recreation use has steadily increased since FY 1990 and is now close to the lower-level prescribed in the Plan (see Figure A-4-1). If the current trend continues, the annual use will be within the Plan's prescribed range in FY 1993.

The low use experienced in FY 1989-90 was because of major reconstruction work occurring on U.S. Highway 2 between Libby and Troy, Montana and the poor fishing success experienced at Lake Koocanusa. This discouraged some incoming tourist travel because of the long delays, rough road surfaces and the lack of "keeper-size" Kokanee salmon.

Finding: This monitoring item is outside the prescribed range stated in the Plan but the trend is upward and close to the -20% level.

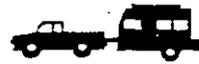
Table A-4-1 Developed Recreation Site Use In RVD's

Fiscal Year	Actual Use	Actual Use as a Percent of Estimated Use ¹
1988	204,000	69
1989	162,000	55
1990	171,000	58
1991	196,000	66
1992	225,000	76
Average	192,000	65

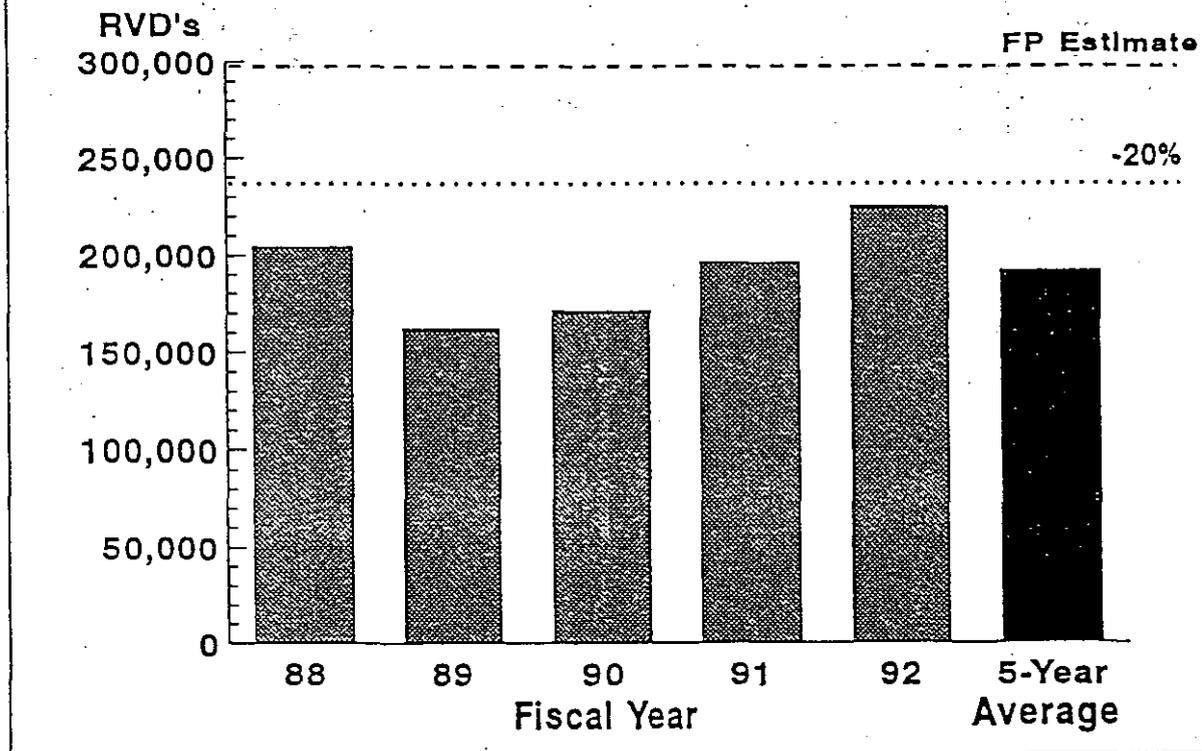
¹ The Forest Plan estimate is 297,000 RVD's per year.

Figure A-4-1

Developed Site Use (RVD's)



(Campgrounds, Picnic Sites, etc.- FY 1988-92)



RECREATION

ORV Use Effects: Monitoring Item A-5

ACTION OR EFFECT TO BE MEASURED:	Determine the environmental effects of Off-Road-Vehicle (ORV) use and conflicts with other uses, if any.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Site deterioration to soil and water resources, permanently affect a sites' ability to recover, become a safety hazard, or detract from the recreation experience.

Purpose: This monitoring item was established because of a concern over potential increases in ORV use on the Forest. The Plan requires that this item be reported once every five years. The expected accuracy, and reliability of the information is low to moderate.

Background: The combination of dense vegetation and/or steep terrain in many areas on the Forest prevents the use of wheeled Off-Road-Vehicles (ORV's) off the constructed road system. In the less densely vegetated and/or more gentle terrain where ORV's can be readily used, some effects have been reported. One of these areas is located below the high-waterline of Lake Kooconusa, a 36,000 acre reservoir located on the Kootenai River behind Libby Dam. Other observed areas are in big-game winter-range near the town of Libby, and on closed Forest development roads, Forestwide.

Results: About 3-5 acres of total disturbed area has been reported in the vicinity of Tobacco Plains below the high-waterline of Lake Kooconusa. The concern is for possible disturbance to cultural resources. Some disturbance to wildlife in big-game winter-ranges is suspected to be occurring in the vicinity of Libby, but no measurable effects have been reported. Other effects have been noted on closed Forest development roads, such as damage to earthen berms and barriers, but no measurements have been taken.

Evaluation: Forestwide, the magnitude of ORV effects reported during the first five years appears to be minor. Continued monitoring will be done to determine if ORV effects are increasing or decreasing and to what extent.

Finding: This monitoring item is inconclusive because the Plan did not specify any quantitative amounts to compare against (number of acres, miles of trails, etc.).

RECREATION

Roadless Area Changes: Monitoring Item A-6

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

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

Background: There were 32 IRA's evaluated during the preparation of the Forest Plan. (An IRA, by definition, contains about 5,000 acres or more of Federal land that does not contain any permanent signs of mans development, such as timber harvest areas and roads.) These 32 IRA's contain almost 400,000 acres. Of this total, about 334,000 acres (84%) are designated to remain roadless and are not available for development such as timber harvest and road construction. The remaining 66,000 acres (16%) were designated to be available for possible development, such as timber harvesting and road construction. (See Appendix C-1 for detailed information on the IRA's.)

Of the 66,000 acres of IRA's designated for development, the Forest Plan EIS estimated that 10,500 acres would be developed through timber harvesting and road construction during the 10-year Plan period (EIS, pg. II-96). This is an average of 1,050 acres per year or 5,250 acres at the 5-year review point. NOTE: about 10,000 acres of Forest were estimated to be developed as a result of mining development (see Monitoring Item G-1). Much of this mineral-rich land is located within IRA's. As a result of these combined activities (timber harvesting, road construction and mining) the estimate of 20,000 acres or 5% of the total 400,000 acres of IRA's was derived for the Plan period.

The Monitoring Plan also estimates that a 5% change would occur in the distribution of the IRA's after 10 years. This amounts to a difference of two less IRA's after 10 years (5% of 32 IRA's and rounded up) or one IRA after 5 years.

Results: Table A-6-1 displays that 4,480 acres of development has occurred in the IRA's as a result of timber sales during the last five years. The changes shown are actual changes on-the-ground, not just approved changes. No changes in IRA's occurred because of mining (see Monitoring Item G-1). There has been a reduction of one less IRA on the Forest which is the Gold Hill IRA (#668). See Appendix C-1 for details of any acreages changes by IRA including any changes that occurred prior to FY 1988, the start of the Forest Plan.

Evaluation: The development of 4,480 acres of IRA's is close (85%) to the 5,250 acres projected at the 5-year review point (see Figure A-6-1). The reduction of one less IRA is also consistent with the Plan's projection. The Gold Hill IRA (#668) is now developed to the point that there are 4,500 acres of roadless land remaining (see Appendix C-1). This means that it no longer qualifies as an IRA and will no longer be monitored as part of this A-6 monitoring requirement.

For more information on the specific timber sales involved in the IRA's developed, see Appendix C-2.

Finding: This monitoring item is on-track with the estimates stated in the Plan EIS for acres developed as a result of timber sales, and is on-track with the changes in the number of IRA's. The acres anticipated for mineral development are less than projected (see Monitoring Item G-1).

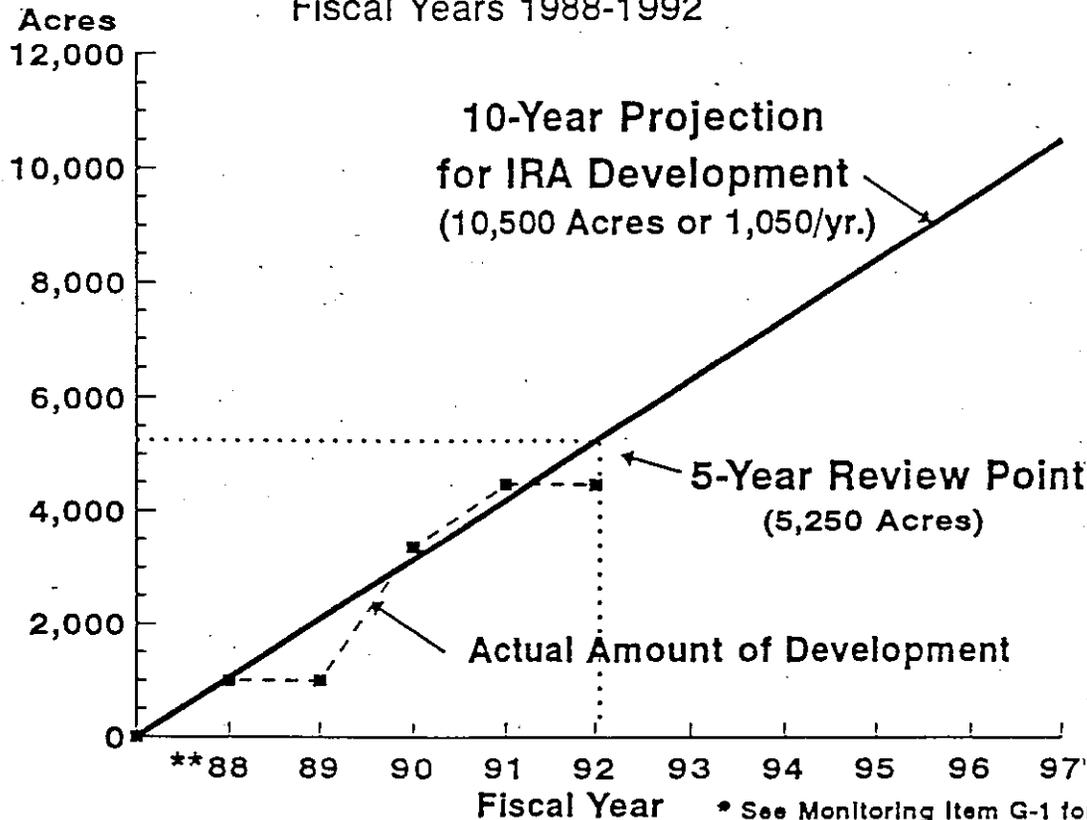
Table A-6-1 Inventoried Roadless Area Changes (acres)

Fiscal Year	Forest Plan Estimated Development (cumulative)*	Actual Amount of Development (cumulative)
1988	1,050	1,000
1989	2,100	1,000
1990	3,150	3,370
1991	4,200	4,480
1992	5,250	4,480

* The Forest Plan estimate is 1,050 acres per year.

Figure A-6-1

**Inventoried Roadless Areas (IRA's)
Development by Timber Sales & Road Construction ***
Fiscal Years 1988-1992



**Forest Plan Approved in 1988

* See Monitoring Item G-1 for IRA Development by Mineral Activity

ARCHAEOLOGY

Cultural Resource Management: Monitoring Item A-7

ACTION OR EFFECT TO BE MEASURED: Determine the degree of compliance with 36 CFR 800 (Protection of Cultural Resources).

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: More than 10% variance from cultural resource mgmt. standards as directed by 36 CFR 800.

Purpose: This monitoring item was established to help ensure that cultural resources (both historic and prehistoric) were adequately protected. The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is high.

Background: The National Historic Preservation Act (NHPA) and the implementing regulations (36 CFR 800) direct the federal government to locate, inventory, and protect the historic and prehistoric properties (cultural resources) from activities occurring on all federal lands. The procedure established is to consult with the respective State Historic Preservation Officer (SHPO) in making eligibility determinations, and in making recommendations for those properties found eligible for nomination to the National Register of Historic Places. To ensure that potentially eligible properties are not destroyed by accident, inventories and consultation are conducted before any projects are implemented (such as timber sales, etc.).

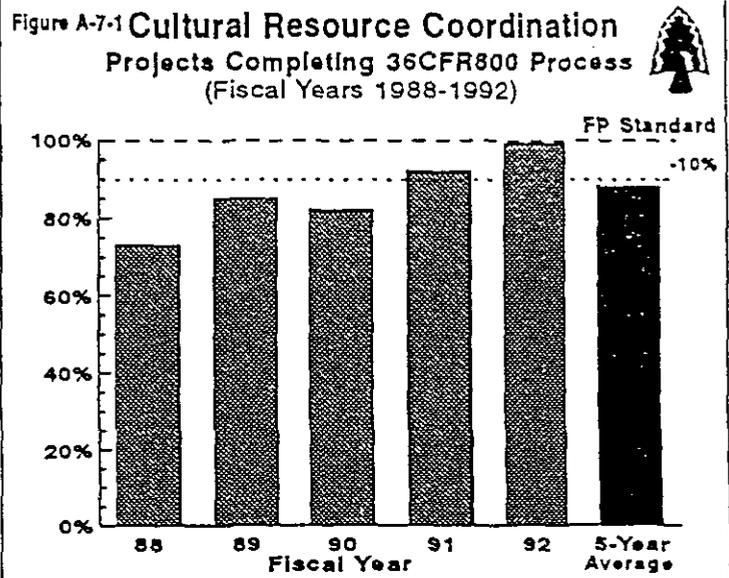
Results: Table A-7-1 displays the results of the last five years of monitoring. A total of 1,131 projects were proposed that required consideration under 36 CFR 800. Of this total, 990 projects successfully completed the required consultation before the project was implemented.

Evaluation: The annual accomplishments for the first three years were below the desired level of 90%, but the steady upward trend that began in FY 1988 reached and exceeded the desired level during the last two years. The average annual accomplishment level for the last five years is 88% which is close to the 90% level prescribed in the Plan.

Finding: This monitoring item is on-track and moving toward the 90% range specified in the Plan.

Table A-7-1 Cultural Resource Mgmt.

Fiscal Year	Projects Requiring Consideration Under 36 CFR 800	Projects Completing 36 CFR 800 Process	Percent Completed
1988	211	154	73
1989	163	139	85
1990	197	161	82
1991	216	196	92
1992	344	340	99
Totals	1,131	990	ave. 88



WILDLIFE AND FISHERIES

Elk Habitat: Monitoring Item C-1

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

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

Background: There's about 1,300,000 acres of elk summer range on the Forest and potential changes to this habitat are analyzed when projects (timber sales, etc.) are proposed. This analysis uses the habitat effectiveness determination process outlined in the "Central Zone Elk Habitat and Timber Management Guidelines." The process uses such factors as: the amount of roads open to motorized use (open-road density), the amount of dense vegetation that can conceal an elk from observation (hiding cover), and the amount and dispersion of openings (forage). These factors are compared against the existing condition to determine whether the habitat is improving, maintaining or declining in overall capability.

Results: During the last five years, measurements were done on 472,000 acres of elk summer range which is about 36% of the total. About 282,000 acres were found to be in an improving condition (60%) and 138,000 acres are being maintained in the existing condition (29%). The remaining 52,000 acres are in a declining condition (11%). No previous baseline measurements are available for comparison prior to the Forest Plan.

Evaluation: If the amount of habitat measured is a reasonable indication of what's occurring on the entire Forest, then habitat effectiveness of the majority (60%) of the elk summer range may be in an improving condition. This can probably be attributed a lot to the increased amount of road closures which were directed by the Forest Plan standards for big-game management (see Monitoring Item L-1). Additional contributions to elk habitat effectiveness improvement are probably also occurring because of habitat management measures implemented for grizzly bears, a threatened species on the Forest. These additional benefits occur because there's significant overlap of elk summer range and grizzly bear habitat (see Monitoring Item C-7).

Finding: Based on the information stated above, the monitoring item is on-track with the Forest Plan goal to provide for improvements in elk summer range habitat.

WILDLIFE AND FISHERIES

Elk Populations: Monitoring Item C-2

ACTION OR EFFECT TO BE MEASURED:	Determine changes in elk populations.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Any downward trend in elk populations.

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

Background: Elk population and hunting statistics are based on the Elk Hunting and Harvest Report, hunter-checkstation information, and aerial surveys. The figures represent the Hunting Districts that are generally encompassed by the Kootenai Forest (100, 101, 103, 104 and 121). The Montana Dept. of Fish, Wildlife and Parks provided the data used in this monitoring item and we thank them for their cooperation. Please note that the conclusions drawn are the responsibility of the Kootenai Forest.

Elk populations are the product of many factors including habitat conditions (improving or declining), weather severity (severe or mild winters), and hunting regulations (liberal or restrictive). The elk population trends observed over the last five years generally reflect the changes occurring in all these factors.

Results: Elk numbers have increased on the Forest during the last five years, and one reason has been the implementation of road closures as directed by the Forest Plan. This important factor has resulted in an overall improving trend in elk habitat effectiveness on the Forest (see Monitoring Item C-1). Modifications in the hunting regulations by the State of Montana during this same period have probably also contributed to the increase in population. Another factor may be the succession of relatively mild winters which has kept elk survival and reproduction at high levels. Calf production has generally ranged from 30+% to 40+% in terms of calves per 100 cows during the 5-year period.

The general increase in elk population can also be verified by the observed hunting success on the Forest. Even though the amount of elk hunting has remained fairly constant within the range of about 60,000 - 70,000 hunter days, the increased harvest of elk reflects the increasing population trend and generally favorable weather during the hunting season. Elk harvest has ranged between about 700 - 1,400 annually and is on a general increase. Elk hunter success during this period was highly variable between the six Hunting Districts on the Forest and between each year, ranging from less than 5% to as high as 20%.

Evaluation: Although the data displayed above indicates an increase in the total elk population, other data suggest that the number of 6-points+ mature bull elk may be approaching a critical threshold. On the Kootenai, the harvest of 6-points+ bulls (based on hunter harvest survey and hunter-checkstation data) and the proportion of brow-tined bulls observed in aerial surveys has been highly variable from year to year and shows no clear trend of an increase or decrease for the last five years. In the longer term, mature bull harvest has declined in northwest Montana (J. Brown, MDFWP). The development of previously unroaded and heavy forest cover, the improvement in hunting technology and skill level of hunters, and a future increase in the number of hunters has the potential to significantly reduce the proportion of mature bulls available for hunting or non-consumptive uses. This emerging issue of elk vulnerability will be further assessed during the 5-year review and evaluation (see Monitoring Item H-2).

Finding: Based on the information stated above, the monitoring item is on-track with the Forest Plan goal to insure that projected increases in elk populations are occurring.

WILDLIFE AND FISHERIES

Other Big Game Habitat: Monitoring Item C-3a

ACTION OR EFFECT TO BE MEASURED: Determine changes in other big-game habitat besides elk.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Any downward trend in habitat capability.

Purpose: This monitoring item was established to help ensure that habitat for other big-game species was maintained or enhanced. The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is low to moderate.

Background: Habitat capability trends have been monitored for six big-game species other than elk on the Kootenai Forest. These six species are mule deer, whitetail deer, bighorn sheep, mountain goat, black bear and mountain lion. Observations were also reported on conditions in moose habitat.

Results and Evaluation: by individual species.

Mule Deer – This species is widespread across the Forest and the overall habitat trend appears static. Habitat improvements, such as prescribed burning on winter ranges and increased road closures, have had positive influences. Some offsetting factors are new road construction (which reduces security habitat) and the continuing vegetative succession of grasses and shrubs to trees because of fire control measures.

Whitetail Deer – This species is also widespread across the Forest. The overall habitat trend also appears static, but site-specifically there are increases and decreases. Positive influences have occurred because of increased vegetative diversity and edge resulting from timber harvesting, and direct habitat improvements such as prescribed burning and slashing in overgrown browse areas. The negative influences are the result of mountain pine beetle-infested lodgepole pine stands and the associated timber harvest over extensive areas. This causes the loss of cover and reduces habitat diversity such as edges. Other negative influences have been several large wildfires over the last five years which have also impacted whitetail deer habitat by reducing the available cover and habitat diversity.

Bighorn Sheep – Four distinct populations exist on the Kootenai Forest. These include the Berray Mountain/Cabinet Wilderness herd, the Kootenai Falls herd, the Ural Tweed/Koocanusa Reservoir herd, and a herd in the Ten Lakes Scenic Area. These herd areas constitute the primary bighorn sheep habitats.

The overall habitat trend on the Forest is increasing because of major accomplishments in habitat improvement (prescribed burning) in the Kootenai Falls herd area and the Ural Tweed/Koocanusa Reservoir herd area. Some decreases in habitat condition have been reported in the Berray Mountain/Cabinet Wilderness herd areas because of continuing vegetative succession.

Mountain Goat – This species is limited primarily to the East and West Cabinet Mountain ranges on the Kootenai Forest. The habitat trend is static to possibly decreasing. Any decrease is due to the continuing vegetative succession resulting from the lack of periodic fires or prescribed burning at higher elevations.

Black Bear – This species exists over the entire Forest and the overall habitat trend is considered static. Timber harvesting has had positive influences on habitat by creating some desirable foraging areas, but it's also had some negative influences by reducing security and habitat effectiveness through new road construc-

tion. Road access restrictions have had an offsetting effect on the loss of security. The continual vegetative succession due to fire control has reduced the amount of desirable foraging areas. The net result is that there is no clear indication of an overall increase or decrease in black bear habitat capability.

Mountain Lion – This species is a predator and habitat generalist, and its capability for existence depends largely on the abundance of prey. Because the populations of almost all the prey species are increasing, the habitat condition trend for mountain lion is also considered to be increasing. See Monitoring Item C-3b, Other Big-Game Populations.

Moose – Habitat conditions have not been formally monitored for moose but the overall observed trend is increasing. This is because of the increased amount of timber harvest areas on the Forest that are 10-20 years old, which are heavily utilized by moose for foraging.

Summary – Habitat trends are generally increasing for the bighorn sheep, mountain lion and moose. Condition trends are generally static for the whitetail deer, mule deer and black bear. Habitat conditions are static to possibly declining for the mountain goat and warrants further monitoring.

Finding: Based on the information stated above, the monitoring item is on-track with the Forest Plan.

WILDLIFE AND FISHERIES

Other Big Game Populations: Monitoring Item C-3b

ACTION OR EFFECT TO BE MEASURED: Determine changes in other big-game populations besides elk.

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

Purpose: This monitoring item was established to help ensure that populations of other big-game species were maintained or enhanced. The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is low to moderate.

Background: Big game population and hunting statistics are based on Hunting and Harvest Reports, hunter-checkstation information, aerial surveys, and casual observations. The figures for each species represent Hunting Districts that are generally encompassed by the Kootenai Forest. The Montana Dept. of Fish, Wildlife and Parks provided most of the data used in this monitoring item and we thank them for their cooperation. Please note that the conclusions drawn are the responsibility of the Kootenai Forest.

Results and Evaluation: by species.

Deer -- There are two species on the Forest, mule deer and whitetail deer. Hunter harvest statistics and observations by Forest personnel indicate an increasing trend in the total combined deer population over the last five years. However, further analysis indicates that there may be some differences in population trend between the two deer species.

The annual harvest of mule deer declined during the period from a high count of about 2,400 in 1988 to a low count of about 1,800 in 1990. (The harvest increased slightly in 1991 due to snow conditions during the hunting season.) The reasons for the downward trend in mule deer harvest are unclear, and it's unknown whether this trend represents an actual decline in the population or if it only reflects short-term variability in the harvest. The long-term trend in mule deer populations has been up since the 1970's (J. Brown, MDFWP). If there has been a recent decline, contributing factors may be the control of wildfire and the advancing vegetative succession which would favor whitetail deer over the mule deer. (Advancing vegetative succession means that the vegetation is gradually changing, such as from a grass and shrubs to trees.) Because of this possible trend, a closer monitoring of mule deer populations appears warranted. In contrast, the whitetail deer harvest has steadily increased during the 5-year period from about 5,600 to 8,100. A series of mild winters has probably contributed to this increase in the whitetail deer population.

Deer hunting has increased during the last 5-year period from about 90,000 hunter-days in 1988 to 114,000 hunter-days in 1991. Hunter success has remained stable during the period at around 50%. The proportion of trophy deer (4x4 points or larger) in the harvest has also remained stable and slightly exceeds 50%.

Moose -- Populations on the Forest appear to be stable to increasing based on hunter harvest statistics and casual observations. Moose hunting is by a special permit issued through a lottery system, and the number of permits issued by the State of Montana has increased during the last five years. Hunter-days expended on moose varies between 800-1,000 annually and hunter success is generally above 90 percent.

Bighorn Sheep -- Four distinct populations exist on the Kootenai Forest. These include the Berray Mountain/Cabinet Wilderness herd, the Kootenai Falls herd, the Ural Tweed/Koocanusa Reservoir herd, and a herd in the Ten Lakes Scenic Area.

Based on hunter harvest statistics and aerial surveys, the Berray Mountain and Kootenai Falls herds appear to have stable populations. Intensive monitoring of the Ural Tweed herd, in conjunction with the Libby Dam mitigation program, has shown this population to be increasing since the early 1980's. As a result, three hunting permits have been issued annually for this herd beginning in 1990. The Ural Tweed herd had not been hunted previously for several decades. Research is currently ongoing on the 10 Lakes herd, and its population trend is unknown at this time. This international herd is unhunted in the U.S. portion of its range but some permits are issued annually to Canadian hunters.

For the three hunted bighorn sheep populations, hunter days typically exceeds 200 annually and hunter success ranges from about 70-100%.

Mountain Goat -- This species is limited primarily to the East and West Cabinet Mountain ranges on the Kootenai Forest. Hunter harvest statistics and aerial surveys support a conclusion that goat populations have been stable over the last five years with minor annual fluctuations. About 40-50 hunter-days are expended on goats annually with a hunter success rate ranging from 80-100%.

Black Bear -- Harvest statistics for the past 20 years suggest a downward trend in the black bear population in northwestern Montana. During the 1970-1990 period, bear harvest remained relatively constant while hunter numbers increased significantly. Hunter success decreased roughly in half while the number of hunter-days required to harvest a bear roughly doubled. Part of this change may be due to a shorter and earlier spring bear hunting season. Kasworm and Their (pers. comm.) modeled black bear survival rates on the Kootenai Forest from 1983-1990 and concluded that the mortality rate (mostly due to hunting) exceeded a sustainable level. During the 20-year period, the State of Montana has made some adjustments in black bear hunting regulations in an effort to maintain the population. The population trend has been monitored annually since 1982 with an aerial survey of bears feeding in open shrubfields. The number of bears observed per unit of survey effort has remained relatively constant through this period, perhaps indicating a stable population. A natural concentration of bears at key feeding sites could also be an inherent source of bias in these survey results.

It's possible that within the last five years, the apparent long-term downward trend may have stabilized or reversed. The average age of harvested bears (as determined through a mandatory tooth turn-in program) has increased while the percentage of females in the harvest has decreased. These are both indicators of an increasing population. If the population has become stable or increasing in recent years, probable reasons would include: adjustments in the hunting regulations; implementation of the road closures required by the Forest Plan which provides the needed security for bears; and a succession of several good huckleberry crops which is known to enhance cub production. Continued monitoring of the black bear population is needed to confirm the suspected recent trends.

Mountain Lion -- This species appears to be on the increase throughout much of its range and the Kootenai Forest is no exception. An increasing number of observations, increases in the harvest quota allowed by the State, and the rate at which harvest quotas are filled all tend to support this conclusion. The increase in mountain lion populations is most likely tied to the increasing big-game populations, which are their primary prey species.

Summary -- Most of the other big-game populations such as whitetail deer, moose, bighorn sheep, mountain goat and mountain lion appear to be either stable or increasing. Nevertheless, there is some concern whether the mule deer population could be on a recent downward trend after a period of increase, and whether the black bear population can sustain the current harvest rate.

Finding: Based on the information stated above, the monitoring item is on-track with the Forest Plan, except for mule deer and black bear which are inconclusive.

WILDLIFE AND FISHERIES

Old-Growth Habitat Species: Monitoring Item C-4

ACTION OR EFFECT TO BE MEASURED: Determine population levels of old-growth dependent species.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Any downward trend approaching 40% of population potential.

Purpose: This monitoring item was established to help ensure that viable populations of old-growth habitat species were adequately provided for. The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is low to moderate.

Background: The pileated woodpecker (*Dryocopus pileatus*) is the designated old-growth habitat indicator species on the Forest.

Results: No surveys were undertaken during the last five years to determine trends of pileated woodpeckers.

NOTE: The Forest participated in a Regional effort to quantitatively and qualitatively describe the habitat requirements for maintenance of viable populations of this species. At this time, technically reliable and cost efficient techniques for conducting population trend surveys for pileated woodpecker are not established, and discussions among wildlife professionals are continuing on this subject. At this time, it's not been determined if the Forest should independently survey for this species, or if efforts on the Kootenai should only contribute toward a much larger combined-Forest or Regional survey effort.

Evaluation: Informal observations provide no indication of any major population changes for this species during the last five years.

Finding: This monitoring item is inconclusive.

WILDLIFE AND FISHERIES

Old-Growth Habitat: Monitoring Item C-5

ACTION OR EFFECT TO BE MEASURED:	Maintain habitat capable of supporting viable populations of old-growth dependent species (10% old-growth in each drainage).
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.

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

Background: The Forest Plan specifies that 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 ideally would 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 validation surveys for FY 1992, including the totals for the last 5-year period (1988-92). Over 212,000 acres were surveyed in FY 1992 with 20,930 acres validated and protected as old-growth habitat. Forestwide, over 817,000 acres have now been surveyed and 91,840 acres are validated as protected old-growth habitat (11.2%).

Evaluation: For the total acres currently validated, 11.2% 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. The Forestwide results indicate that 84% of the validated old-growth habitat contains all the desirable old-growth attributes which means it is currently in a fully effective condition (see Figure C-5-1). This also means that the remaining 16% are replacement stands because they don't contain all the desirable old-growth attributes at this time.

After five years of old-growth habitat validation work, the Forest has completed 44% of the total acreage to be surveyed. In addition, about 114,000 acres are partially completed and much of this acreage will be reported in our FY 1993 report next year (see Figure C-5-2). Because of discrepancies found 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. These additional stands have been added to the old growth management areas (see Monitoring Item E-3).

Finding: Based on the information stated above, the monitoring item is on-track with the Forest Plan.

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	94,210	12,730	13.5	8,450	66
1990	176,560	18,770	10.6	17,030	91
1991 ³	334,300	39,410	11.8	36,520	93
1992	212,380	20,930	9.9	15,500	74
Totals ¹	817,460 ²	91,840	ave. 11.2	77,510	ave. 84

¹ Totals may not be exact because of rounding. ² Does not include 114,000 acres which have been partially completed as of 9/30/92, or 70,000 acres which were re-surveyed to provide a more consistent Forestwide analysis.

³ Corrections were made in FY 1992.

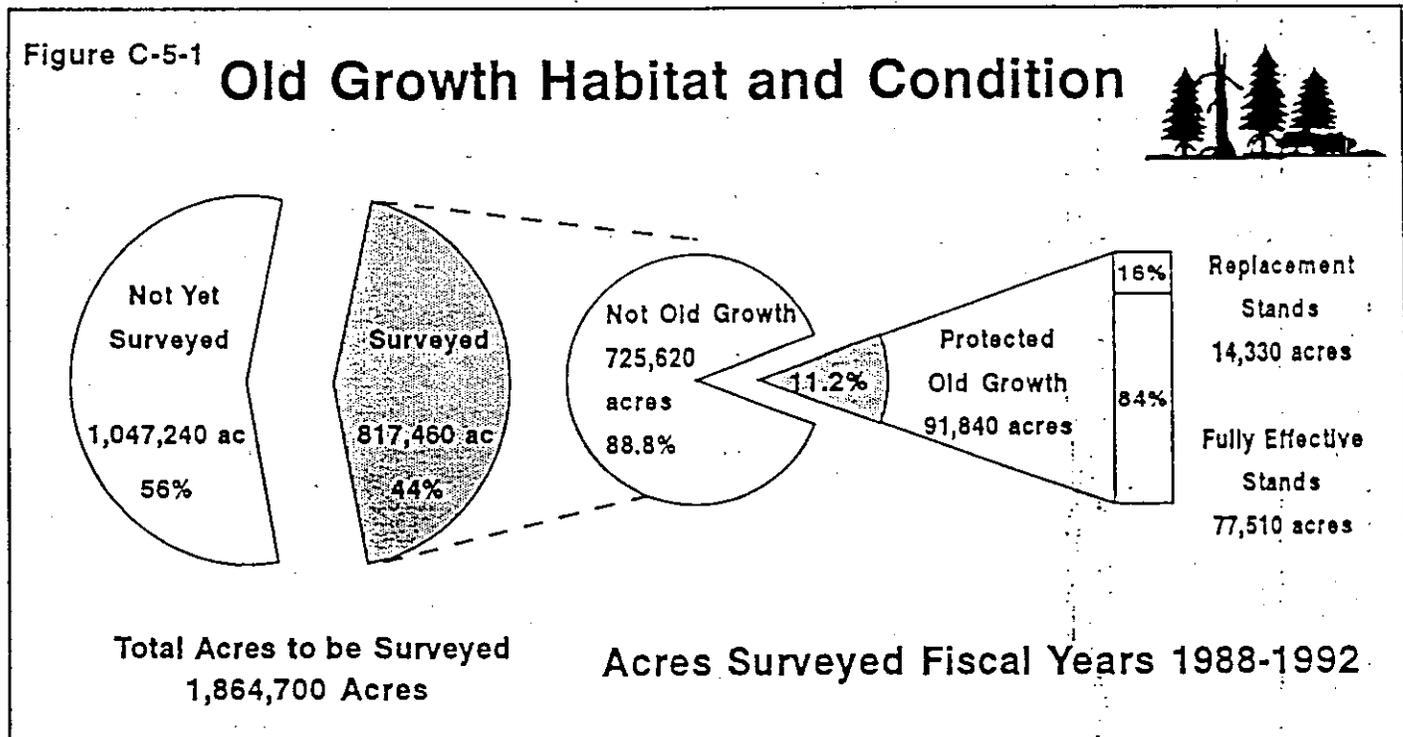
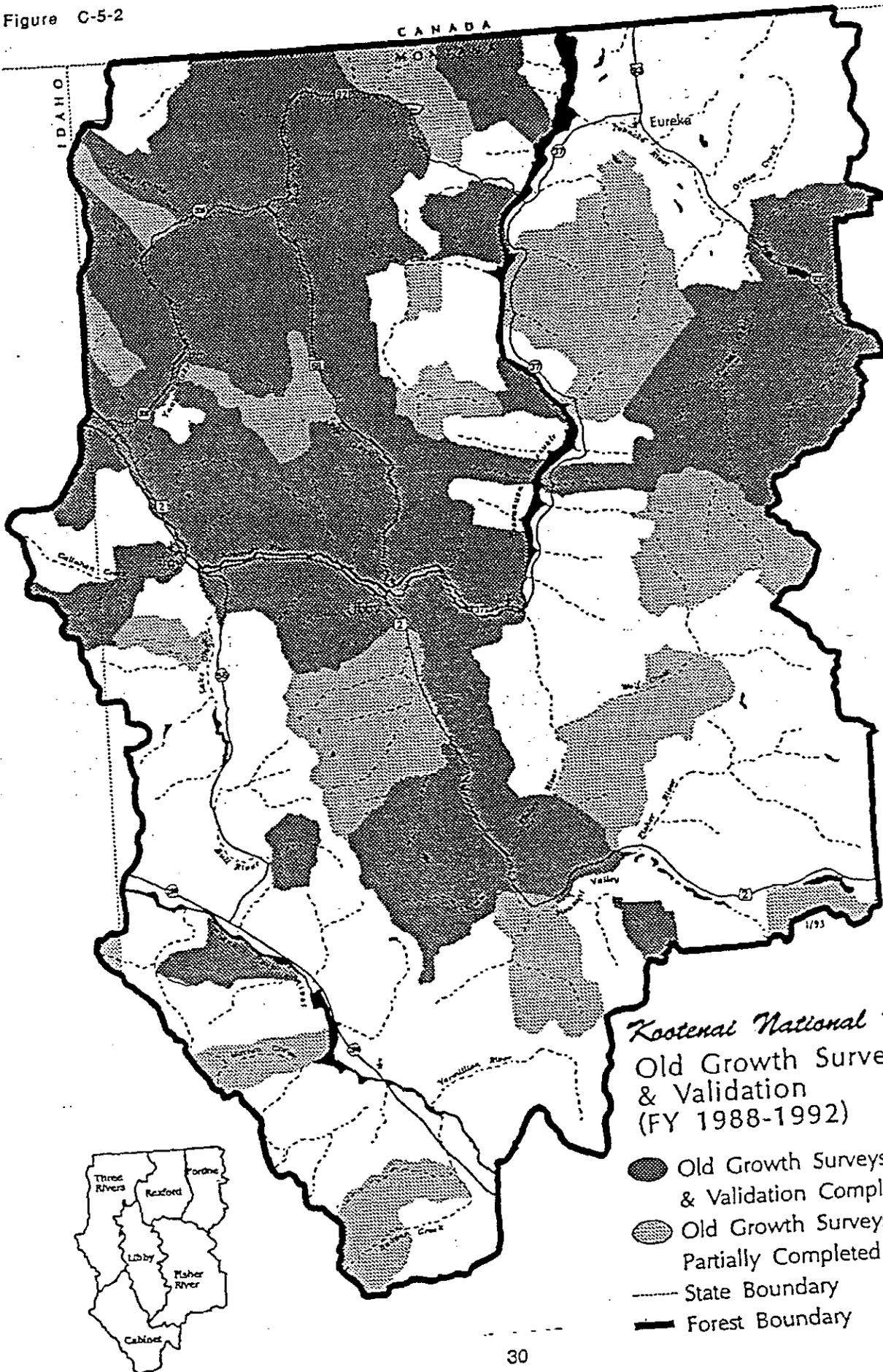


Figure C-5-2



WILDLIFE AND FISHERIES

Cavity Nesters: Monitoring Item C-6

ACTION OR EFFECT TO BE MEASURED:	Determine the amount and condition of cavity-nester habitat.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Any reduction in habitat capability approaching 40% of potential.

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

Background: Appendix 16 of the Forest Plan contains the standards and guidelines for maintaining habitat capable of supporting viable populations of cavity nesters. The indicator species for cavity nesters is the pileated woodpecker which is discussed in Monitoring Item C-4. In summary, the standards provide for a minimum number of large dead trees (snags) or live cull trees within certain height and diameter criteria. (Live cull trees are usually broken-topped, or have significant amounts of decayed wood.) These large dead and dying trees are considered to be the critical habitat indicator for cavity nesters, and two of these trees per acre is the minimum amount that should be retained in any regeneration harvest unit.

Results: Information obtained through some limited Forest Plan monitoring and a special survey indicate a wide variance in the amount of cavity habitat being retained. On many of the harvest units, an inadequate amount of snags are left after logging operations are complete. These inadequacies result from being knocked down during logging operations and planting-site preparation, removal for safety purposes, natural windthrow, and being burned-up during slash burning operations. Snags along roadways are also deficient in many areas because of firewood cutting. Overall, considering both harvested and unharvested acreages, the 40% cavity habitat potential is probably being met in most drainages but only because of the amount of unharvested timber still remaining. In a few drainages where extensive timber harvest has occurred, habitat potential is probably below the 40% level.

Evaluation: Overall, the Forest is probably above the 40% cavity habitat potential, but a few drainages are probably below the Forest standard because of past harvest operations. These "below-standard" conditions generally pre-date the Forest Plan.

Finding: This monitoring item is inconclusive because of the lack of Forestwide data, and will be further evaluated during the 5-Year Review.

WILDLIFE AND FISHERIES

T & E Species Habitat: Monitoring Item C-7

ACTION OR EFFECT TO BE MEASURED:	Ensure adequate habitat is provided for recovery of Threatened & Endangered (T & E) Species including: Peregrine Falcon, Gray Wolf, Bald Eagle and Grizzly Bear.
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.

Purpose: This monitoring item was established to help ensure that the Kootenai Forest contributes to the recovery of the listed T & E species. The Plan requires that this item be reported annually. The expected accuracy and reliability of the information is moderate to high.

Results and Evaluation: by species.

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 10 wild nesting pairs in the State which produced at least 15 young birds in 1992 (personal communication with Dennis Plath, 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 on the Kootenai Forest.

There were no reported sightings of peregrine falcons on the Kootenai in fiscal year 1992. 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 in the past 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's 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, four other areas have confirmed wolf activity but no confirmed packs exist to-date (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 6 animals is being monitored within the Kootenai Forest. This pack spends portions of its time both within and outside the recovery area. The pack contains one radio-collared

wolf. 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 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, 1986). 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. There are 74 nesting territories in Recovery Zone 7, and 63 of these were active in FY 1992. Of these, 51 nesting pairs were successful in fledging 74 young eagles (personal communication with Dennis Flath, MT Dept. of Fish, Wildlife and Parks). This indicates that the bald eagle is meeting and exceeding the recovery goal in Recovery Zone 7.

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 wildlife habitat improvement, minerals development, timber harvesting, etc. The Forest also participates in 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 surveys on the Forest which occur mostly along major watercourses. In FY 1992, a total of 103 bald eagles were counted (71 mature and 32 immature). This matches the previous all-time high counts in FY's 1989 and 1991. In addition, 14 active nests with a total of 17 fledged young were monitored in FY 1992. This is a decrease from FY 1991, the previous all-time high count. Still, 27% of all the active nests and 23% of the total successful fledglings in Recovery Zone 7 occurred on the Kootenai Forest during FY 1992. The primary bald eagle survey and monitoring areas are: Kootenai, Clark Fork, Fisher and Tobacco Rivers; and Kooconusa, 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 zones; 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 subdivided into smaller areas for analysis and monitoring, 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 Mountains.

Table C-7-2 shows habitat effectiveness values for each of the GBMU's evaluated during fiscal years 1988-92. Effectiveness is based on the percent of habitat available to bears, and the desired level is 70% or greater. In FY 1992, ten GBMU's are at, or above, the 70% level which is the same overall status as the previous year. Of the eight GBMU's that are below the 70% level, most are improving or maintaining in habitat effectiveness. This steady improvement can be seen in the Forestwide average which is 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 reach the desired level of effectiveness by 1995 as agreed-to in consultation with the U.S. Fish & Wildlife Service.

Un-duplicated sightings of females with young are considered to be important indicators of potential population growth. In FY 1992, there were five confirmed, un-duplicated sightings of female grizzly bears with young in the NCDE. There were three confirmed un-duplicated sightings of female grizzlies with young in the CYE.

Mortality rates are another key indicator of potential population trends. In 1992, there was one known mortality adjacent to the Kootenai portion of the NCDE. There were no known mortalities in the CYE.

Summary: The wolf, bald eagle and grizzly bear have had increased sightings during the last five years. All of the T & E habitats being monitored appear to be improving or at least maintaining. The information shows that the Kootenai Forest is progressing toward providing adequate habitat for T & E species recovery.

Finding: Based on the information stated above, the monitoring item is on-track.

Table C-7-1 Mid-Winter Bald Eagle Survey Count and Spring Nestling 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	15 ¹	22
1992	71	32	103	14	17
Average*	72	23	94	10	14

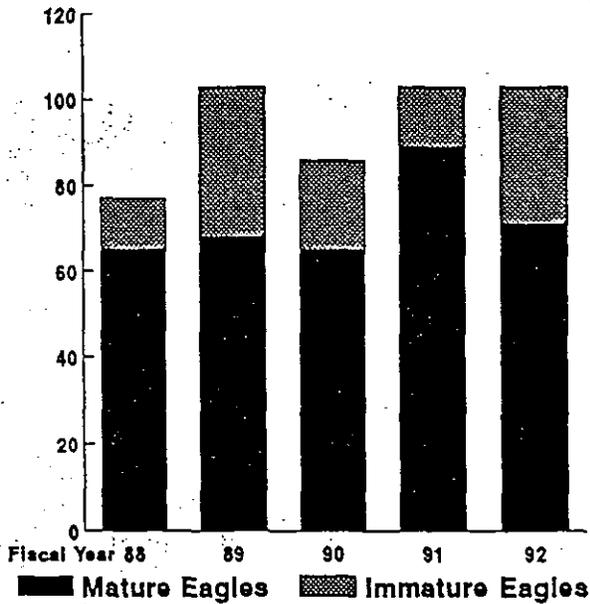
* Averages are rounded off. ¹ Correction in FY 1992.

Figure C-7-1

Bald Eagle Status (Fiscal Years 1988-1992)



Mid-Winter Survey Count



Spring Nesting Results

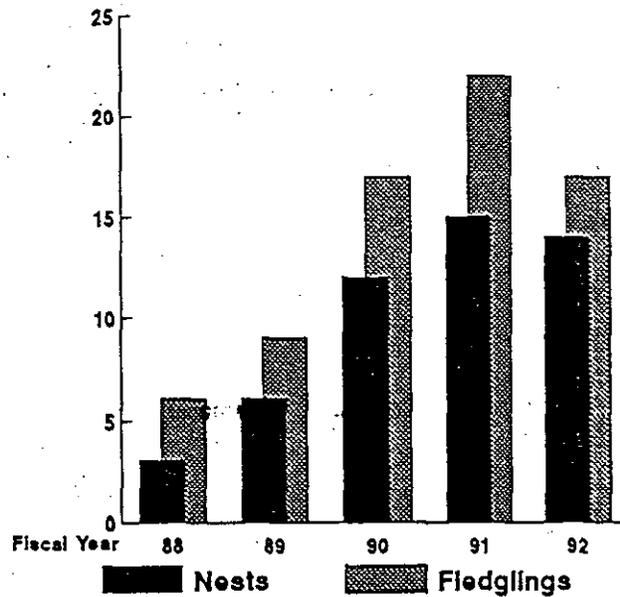


Table C-7-2 Grizzly Bear Habitat Effectiveness (%) by Fiscal Year (FY)

Grizzly Bear Management Unit	FY 1988	FY 1989	FY 1990	FY 1991	FY 92
Above 70 percent:					
#1 Murphy Lake ¹	78	79	78	78	78
#1 Cedar	81	81	81	82	79
#2 Snowshoe	82	82	82	81	82
#3 Spar	70	71	70	70	79
#4 Bull	80	78	80	80	80
#5 Saint Paul	73	77	79	80	78
#6 Wanless	74	74	72	74	76
#7 Silver Butte-Fisher.	87	87	87	87	87
#8 Vermillion	79	80	80	73 ²	73
#9 Callahan	64	55	62	67	70
Below 70 percent:					
#10 Pulpit	43	47	50	56	59
#11 Roderick	60	59	66	68	66 ³
#12 Newton	42	42	43	53	53
#13 Keno	68	68	72	72	69 ³
#14 Northwest Peak	61	61	68	68	68
#15 Garver	50	47	62	62	54 ³
#16 East Fork Yaak	47	46	59	61	62
#17 Big Creek	51	58	58	63	64
Forestwide Average	66	66	69	71	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 - Vermillion, was re-calculated and found to have a lower rating, even though nothing changed on-the-ground.

³ GBMU's #11, 13 & 15 boundaries were changed and found to have a smaller total acreage which resulted in a lower rating.

Figure C-7-2 Grizzly Bear Habitat Effectiveness (Fiscal Years 1988-1992)

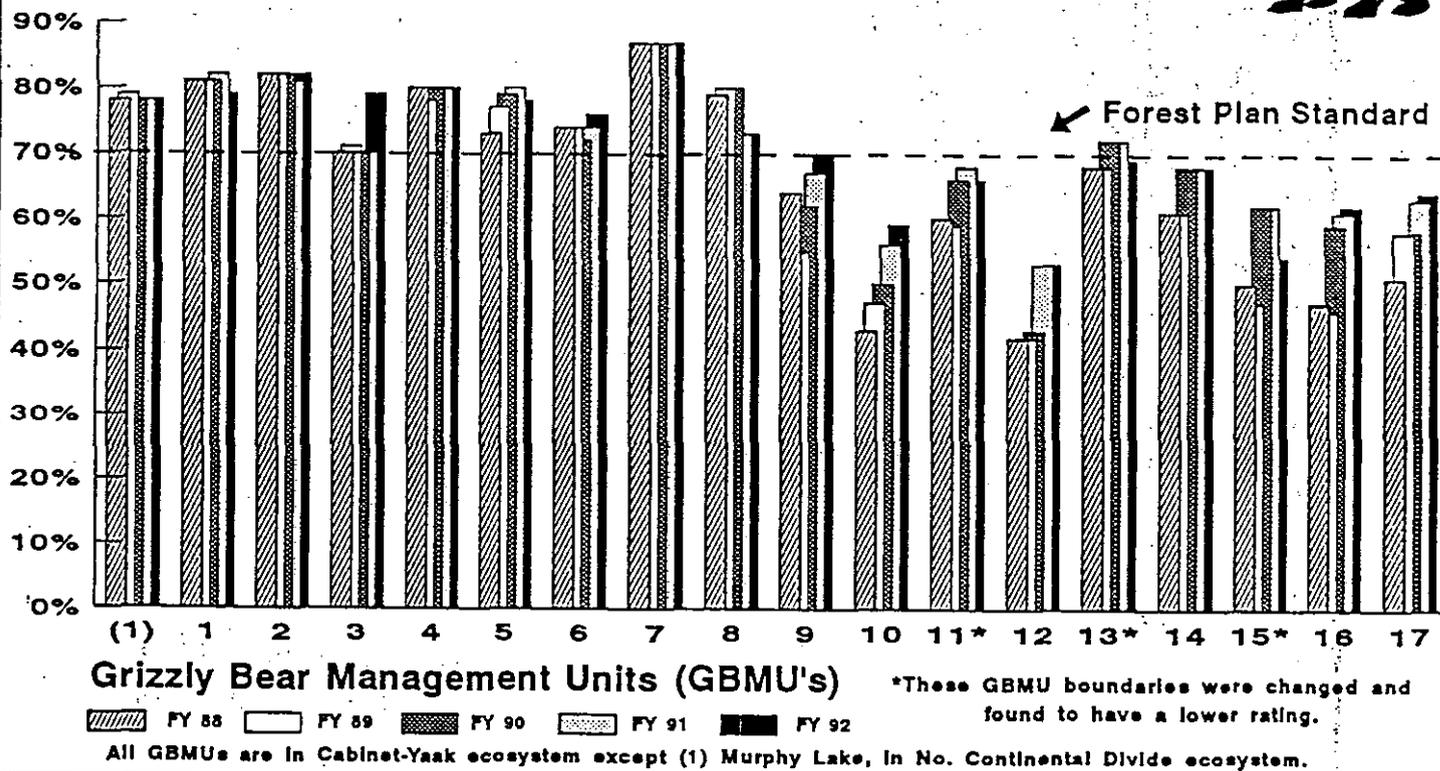
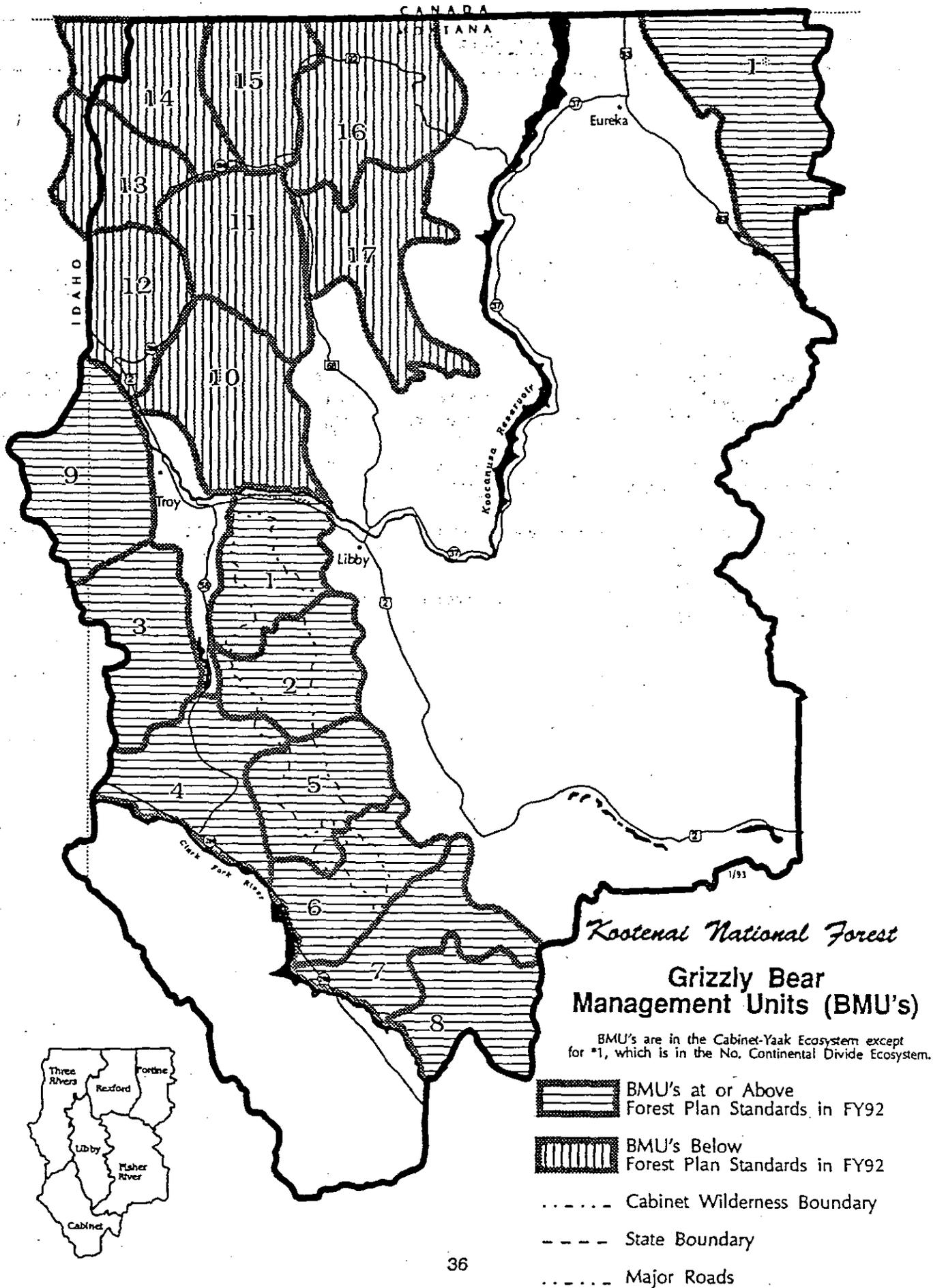


Figure C-7-3



WILDLIFE AND FISHERIES

Indicator Species: Monitoring Item C-8

ACTION OR EFFECT TO BE MEASURED: Determine habitat and population trends for viable populations of indicator species.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Any reduction approaching minimum habitat needed for viable population levels (40% of potential population).

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

Background: The indicator species on the Kootenai Forest are: elk, whitetail deer, mountain goat, grizzly bear, gray wolf, bald eagle, peregrine falcon and pileated woodpecker.

Results: Because of the identified overlap with other monitoring items, this item has been combined with Monitoring Items C-1, C-2, C-3a, C-3b, C-4, C-6 and C-7 to avoid duplication.

Finding: This monitoring item is a duplication with the above-mentioned items and should be dropped from the Plan as a separate item.

RIPARIAN

Riparian Areas: Monitoring Item C-9

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

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Failure to meet State standards.

Purpose: This monitoring item was established to help ensure that riparian habitat conditions are protected on the Forest. The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is high.

Background: One of the Forest Plan objectives is to site-specifically identify and map all riparian areas before any projects such as timber sales are authorized (Forest Plan, page II-11). Since the Forest Plan was approved (9/87), additional Forest guidelines have been completed for the identification, mapping and resource protection necessary to protect riparian areas (see Forest Plan Appendix 26, Riparian Area Guidelines). These Guidelines stratify the Forest into four different stream classes, three of which require specific resource protection before any activities can proceed. These stream classes are: large perennial streams (Class I), smaller perennial streams (Class II), intermittent streams (Class III), and dry draws (Class IV). In addition, voluntary BMPs were initiated by the State of Montana in 1989, and the Montana State Legislature passed a law requiring mandatory Streamside Management Zone Protection in 1991 (HB-731), both of which had practices and stipulations to protect riparian areas.

Results: Two approaches are used to track this monitoring item: the reporting of miles of Stream Classes identified and mapped (Table C-9-1); and the evaluation of BMPs applicable to riparian protection (Table C-9-2).

Table C-9-1 displays the progress in the identification and mapping of the three stream classes considered important for riparian area protection. The total miles of stream classes identified and mapped each year has tripled from 214 miles in FY 1989 to over 600 miles in each of the last three years. The total miles now identified and mapped is 2,166. Please note that two of the stream classes have been further separated to provide more site-specific direction (stream classes II and III have been separated into IIa, IIb and IIIa, IIIb). The total estimated miles of streams needing to be mapped in the suitable timberland is 28,560.

Table C-9-2 identifies the success in implementing riparian and Streamside Management Zone (SMZ)-related BMPs in the last three years. As indicated, these BMPs are being implemented on an increasing basis since auditing of this element began in 1990. As also indicated in Monitoring Item F-1, increased emphasis is needed for the critical BMPs which include the three riparian protection BMPs used here.

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

Fiscal Year	Stream Class I	Stream Class IIa	Stream Class IIb	Stream Class IIIa	Stream Class IIIb ¹	Totals ²
1988-89	37	15	84	79	0	214
1990	75	90	244	246	0	655
1991	18	133	241	194	50	635
1992	28	135	200	276	23	662
Totals ²	158	373	769	795	73	2,166

¹ Stream Class IIIb was added in FY 1991. ² Totals are not exact because of rounding.

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

Fiscal Year	Data Source	Implementation Evaluations	Percent Acceptable or Better	Effectiveness Evaluations	Percent Acceptable or Better
1990	Forest & State (EQC) BMP Audits	201	89	82	87
1991	Forestwide BMP Audits	145	95	145	95
1992	Forest & State (EQC) BMP Audits	241	88	241	96
Totals		587	90	468	94

Evaluation: Progress is being made in the identification and mapping of the riparian areas, but only 8% is currently completed on the suitable timberland. Improvement is still needed in riparian resource protection because we're still below our goal of 100% compliance in BMP implementation and effectiveness.

Finding: Based on the information presented above, this monitoring item is inconclusive.

WILDLIFE AND FISHERIES

Fisheries Habitat: Monitoring Item C-10

ACTION OR EFFECT TO BE MEASURED:	Determine changes in fish habitat and populations.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 10% change in Redd's, +/- 2 degrees change in stream temperature, +/- 10% change in sediment, +/- 10% change in embeddedness, +/- 20% change in debris accumulations.

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

Background: Fish habitat and population concerns overlap with the Kootenai's responsibility for protecting downstream beneficial uses as required by State of Montana and Federal laws and regulations. The Forest Plan committed to 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 management activities that pre-dated the Plan.

Six tasks (on seven representative watersheds) were designated for this monitoring item (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 Forest has directed its efforts at consultation for site-specific projects such as timber sales, and the survey and evaluation of five of the six known sensitive fish species (the bull, interior redband and westslope cutthroat trout, and the torrent and shorthead sculpins). The other sensitive species, sturgeon, is being surveyed and evaluated by the Montana Department of Fish, Wildlife and Parks, the Bonneville Power Administration and the State of Idaho.

Results and Evaluation:

Monitoring data from 1989-92 has been gathered from five representative watersheds but the results are inconclusive. The project-specific monitoring data available from three additional watersheds will be evaluated at a later date. Fish habitat improvement is being completed at a rate that meets the Forest Plan projection (see Appendix A at the end of this report).

During FY 1992, over 75 small watersheds were surveyed for presence of the five sensitive fish species mentioned above excluding the white sturgeon which the States of Montana and Idaho are studying. To date, 43 watersheds have been identified that contain sensitive fish populations. Based on this survey evidence, about 850 miles of fish streams are projected to contain sensitive fish. This would result in about 25% of the total occupied fish habitat on the Forest containing sensitive fish.

Finding: Based on the information stated above, the monitoring item is inconclusive.

RANGE

Range Use: Monitoring Item D-1

ACTION OR EFFECT TO BE MEASURED: Determine if the grazing use measured in Animal Unit Months (AUM's) meets Plan projections.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: +/- 20% of anticipated AUM's.

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

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

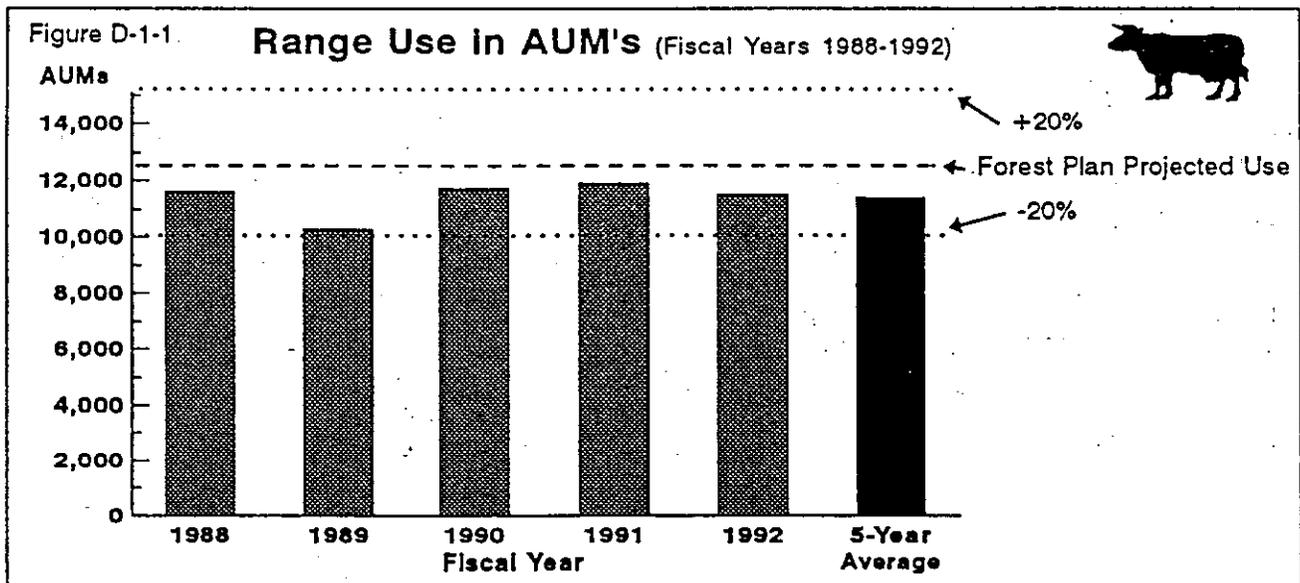
Results: The FY 1992 level of grazing use was 11,500 AUM's or 91% of the projected level.

Evaluation: During the last five years, grazing use has averaged 90% of projected use which is within the range anticipated in the Plan. This lower-than-projected level 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.

Finding: This monitoring item is on-track with the Plan.

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

Item	Forest Plan Projected Use	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	5-Year Average
AUM's	12,600	11,600	10,300	11,700	11,900	11,500	11,400
Percent	100	92	82	93	94	91	90



RANGE

Noxious Weed Infestations: Monitoring Item D-2

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

Purpose: This monitoring item was established to track the status of noxious weeds on the Forest. The Plan requires that this item be reported annually. The expected accuracy and reliability of the information is moderate to high.

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 although work is progressing on completing one. Spotted knapweed is the primary noxious weed species found on the Forest, and 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 and Evaluation:

During FY 1992, the noxious weed program progressed on several fronts. One part of the program is the baseline mapping of the known occurrences of noxious weeds in co-operation with the Lincoln County Weed and Rodent Board. Another part is the direct control and eradication of spotted knapweed, dalmation toadflax and leafy spurge at several locations for a total of 96 acres. Herbicides were used for the leafy spurge and spotted knapweed eradication and handpulling was used on the dalmation toadflax. In addition, rush skeletonweed was handpulled in FY 1992. This was the first reported occurrence of this new weed in northwest Montana.

An increasingly important and growing part of the noxious weed program is the prevention of the spread of these weeds. In FY 1992, over 570 acres were seeded to prevent erosion as well as to provide an established vegetative competition against the unwanted invasion of weeds such as spotted knapweed. Increased prevention is now established through the updating of special use permits for gravel pits. Some gravel pits have been closed to prevent the spread of noxious weeds and others have had special clauses added to the permits to ensure proper management of the gravel pit to prevent the spread of noxious weeds. This upgrading of gravel pit permits has been done in cooperation with the Lincoln County Weed and Rodent Board.

In the final part of the program during FY 1992, the Forest contributed funding to establish six more sites with biological control agents. This control agent is the knapweed root weevil moth which was established on five of the six Districts, all located within Lincoln County. The root weevil moth eats on the root of the spotted knapweed which kills the plant. 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 agent. These sites will continue to be monitored to determine the success of this project.

Finding: Based on the information stated above, this monitoring item is progressing well but inconclusive because of the lack of completed baseline data.

TIMBER

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

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

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

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. **NOTE:** It's important to remember that the ASQ is a projected maximum or ceiling and not a target to be reached at the expense of all other considerations.

In addition to monitoring the ASQ volume on the Forest, the Regional Forester requested that some sub-components of the ASQ volume also be monitored. These other sub-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 sub-components were requested to further define what portions of the suitable base are on-track with the Forest Plan projections and which portions are not. This information should help provide a clearer picture of what changes (if any) might be needed at the end of five years of monitoring, and where they might be needed. This report provides timber sell information only for the inventoried roadless areas and for grizzly bear habitat. Information for sell volume adjacent to private timber lands was not available.

The majority (98%) of the ASQ 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 sub-components would average 223.4 MMBF per year and 3.6 MMBF per year, respectively. Also, about one-third (34%) of the ASQ 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 sub-components would average 77 MMBF per year and 150 MMBF per year, respectively.

Results: The sell volume for FY 1992 is 199 MMBF, the highest level of the last five years and 88% of the estimated ASQ volume (see Table E-1-1). The reason for this higher-than-average sell is the large amount of volume (60 MMBF) advertised at the end of FY 1991 (September) but not actually sold until the beginning of FY 1992 (October). This 60 MMBF is accounted for in this year's FY 1992 Monitoring Report.

Total Suitable Lands - Total timber volume sold for the last five years is 793 MMBF. This is 342 MMBF less than the estimated ASQ volume (see Table E-1-1).

Within Inventoried Roadless Areas - Total timber volume sold after five years is 16 MMBF which is close to the 18 MMBF projected in the Forest Plan (see Table E-1-2).

Within Grizzly Bear Habitat - Total timber volume sold after five years is 228 MMBF. This is 157 MMBF less than the Forest Plan projection (see Table E-1-3).

Evaluation: Table E-1-1 indicates that the average annual sell volume from total suitable lands is at 70% of the ASQ and outside the 95% level prescribed in the Plan. The average annual timber sell from inventoried roadless areas is at the 89% achievement level and the difference is considered reasonable for the small annual volume projected (see Table E-1-2). The average annual timber sell volume from grizzly bear habitat is at the 59% achievement level and is considered to be off-track with the Forest Plan projection (see Table E-1-3).

NOTE: It's important to remember that grizzly bear habitat management includes a variety of resources in addition to grizzly bears. This is because grizzly habitat is located on 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 can also be affecting the timber sell program. A summary of these other known factors both within and outside grizzly habitat are:

Litigation and Appeals - A Ninth Circuit Court injunction on timber sales and road construction in the Upper Yaak River resulted in the deferral of 59 MMBF of timber sales scheduled for FY 1988 and 39 MMBF for FY 1989. This injunction was the result of a lawsuit that was concerned with adequate NEPA procedures, not grizzly bears. 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 35 MMBF since FY 1988.

Utilization Standards - The 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.

Wildlife Snag Management Assessment - 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) there's a shortage of snags and future-s snag replacement trees. Snags and their future replacements are important for birds and small mammals. In order to provide for these wildlife species, a higher-than-expected number of green leaf trees are now required in many of these previously-harvested areas to meet the Plan's snag management standards. In many cases, this requires that a planned overstory removal harvest be deferred permanently to provide for this shortage of future-s snag replacements.

Wildlife Hiding Cover Assessment - Experience indicates that wildlife hiding cover is taking longer to become effective after regeneration harvesting compared to the estimate used in the Forest Planning (FORPLAN) model (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).)

Old Growth Habitat Assessment - Experience revealed that some of the old growth delineated on the aerial photos did not fully meet the criteria on-the-ground, resulting in shortages of this habitat needed to meet the Plan's standard of 10% by area. When a shortage is discovered, additional old-growth habitat must be identified to bring the area up to the required 10% total before any projects can be completed. The additional old-growth habitat needed hopefully is available within the unsuitable management areas in the vicinity. If it's not available there, it must come from the suitable management areas. There's a conflict when a needed old-growth stand in the suitable timber base was previously scheduled for harvest during the Plan period. For more information on this item 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.

Grizzly Habitat Boundary Clarifications - An additional 248,000 acres of grizzly bear management area has been identified as a result of formal and informal consultation with the U.S. Fish and Wildlife Service,

primarily in the upper Yaak River portion of the Cabinet-Yaak Ecosystem. The effects have been reduced timber sale opportunities on 143,000 acres of suitable timber compared to the original Forest Plan assumptions.

Stepped-up Harvest Rate on Adjacent Lands - Faster than expected timber harvesting on intermingled private lands has resulted in delays of Kootenai Forest timber sales because of hydrologic concerns (see Water Yield Increases (F-3) and Timber Harvest Deferrals (E-7). Most of this area is in the southeast corner of the Forest and outside of identified grizzly bear habitat. (See next section.)

Two new assessments have provided some additional information that may also prove helpful in determining the difference between the estimated ASQ and the actual timber sell volumes. They are:

Timber Inventory Assessment - After completing an analysis of the Kootenai, a citizens group has alleged that the mature timber age class was overestimated in the harvest calculation model (FORPLAN). If such a discrepancy exists, it might appear to suggest a flaw in the calculation of the ASQ. However, many factors other than inventory contribute to the regulation of timber harvest. Some of these are: the regulatory constraint of non-declining timber flow and sustained yield management; environmental and resource protection constraints such as watershed harvest limits, wildlife protection standards, etc.; and the actual growth of timber stands from one age class to another (e.g.: immature stands to mature stands). The Forest will be analyzing this classification question during the 5-year review to determine the net effect on the ASQ.

Watershed Condition Assessment - Because of the concerns being expressed for adequate water quality protection, a preliminary review of over 750 watersheds was recently completed. This review included 2,706,000 acres of both public and private lands within the Forest boundary. The results indicate that about 13% of this total combined acreage is in an unacceptable hydrologic condition and that another 29% is close to, or at, the critical threshold of acceptable hydrologic condition. This suggests that 42% of the total combined Forest area has limitations to further developmental activity in the near future (such as timber harvest and road construction). The amount of suitable timberland involved on the Kootenai Forest with this identified area of watershed limitation is 457,000 acres which is 36% of the total suitable timber of 1,263,000 acres. See Appendix E for more detailed information and a map. While this infers a potential significant effect on timber harvesting, much of this watershed condition information is already in the FORPLAN model which calculated the ASQ. During the 5-year review, this additional information will be compared against the original watershed condition assessment used in FORPLAN to determine what the net effect on ASQ is.

Finding: This monitoring item is off-track with the Forest Plan projection. The factors described in the Evaluation section will be quantified for a new FORPLAN calculation during the 5-year review to determine what the difference is in ASQ.

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	FY 1992	Total 5-Year Timber Sell 1988-92	Average Timber Sell per FY	Percent of Annual Forest Plan Projection	5-Year Forest Plan Projected Sell	Difference from Forest Plan Projection
Suitable Lands	227 (ASQ)	173	181	146	94 ¹	199	793	159	70	1,135	-342
Unsuitable Lands	6	2	4	2	1	2	11	2	33	30	-18
Total Timber Sell Program	233	175	185	148	95 ¹	201	805	161	69	1,165	-360
Financed Sell Volume ²	233	241	224	237	165	167	1,034	207	89	1,165	-131

* Some totals may not be exact because of rounding. ¹ Corrected to show the volume sold and awarded.

² The financed sell level for 1993 is 120 MMBF.

For more detailed volume information concerning the timber sell program, see Appendix B-1.

Figure E-1-1

Projected, Financed and Actual Timber Volumes
(Fiscal Years 1988-92)

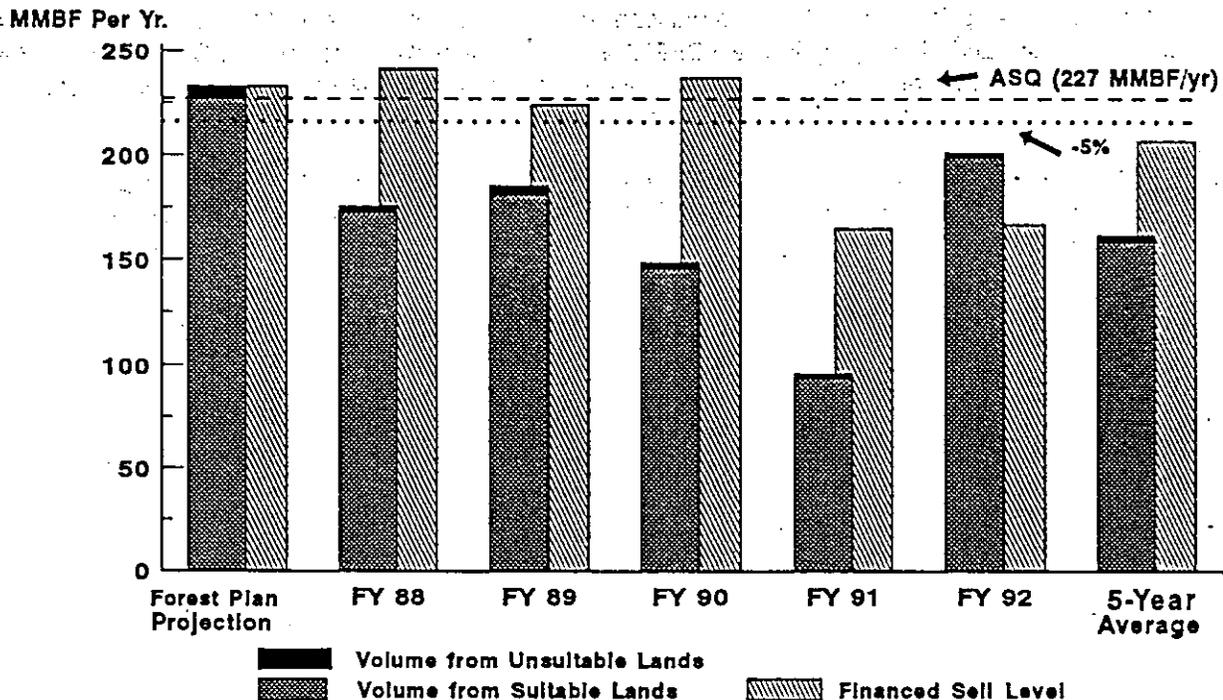
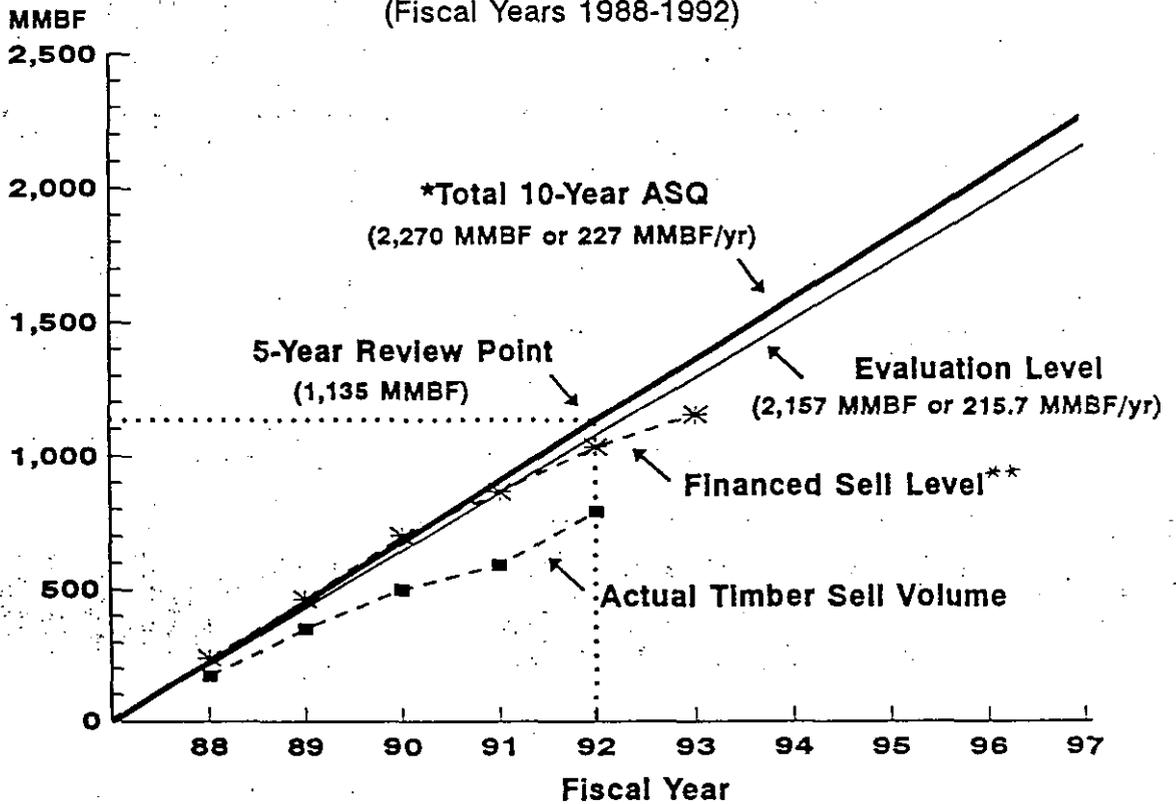


Figure E-1-1a

Projected and Actual Accumulative Timber Volume on Suitable Lands

(Fiscal Years 1988-1992)



*The total 10 Year ASQ is the projected timber volume from suitable timberland, and the maximum 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	FY 1992	Total 5-Year Timber Sell 1988-92	Average Timber Sell per FY	Percent of Annual Forest Plan Projection	5-Year Forest Plan Projected Sell	Difference From Forest Plan Projection
Inventoried Roadless Lands	3.6	3	0	9	4	0	16	3	89	18	-2
Not Inventoried as Roadless	223.4	170	181	137	90 ¹	199	777	155	70	1,117	-340
Total Sell, Suitable Lands	227.0	173	181	146	94¹	199	793	159	70	1,135	-342

* Some totals may not be exact because of rounding. ¹ Corrected to show the volume sold and awarded.

Figure E-1-2 Projected and Actual Accumulative Timber Volume By Land Category (Fiscal Years 1988-1992)

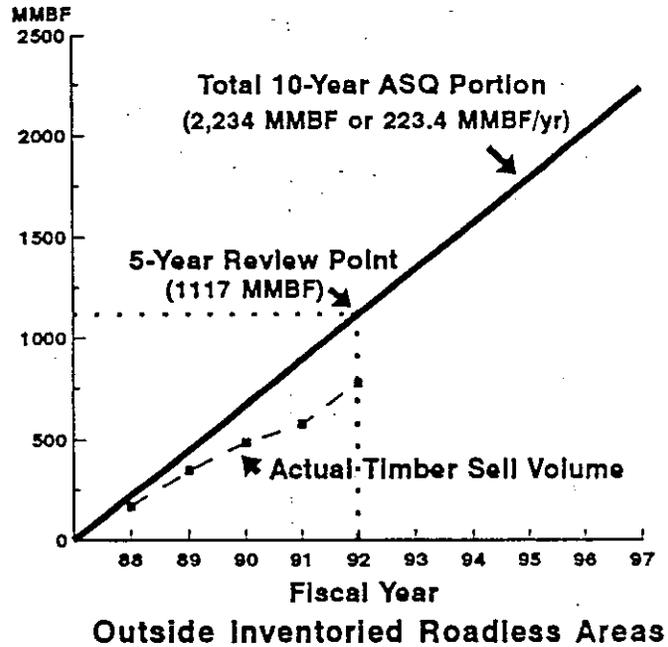
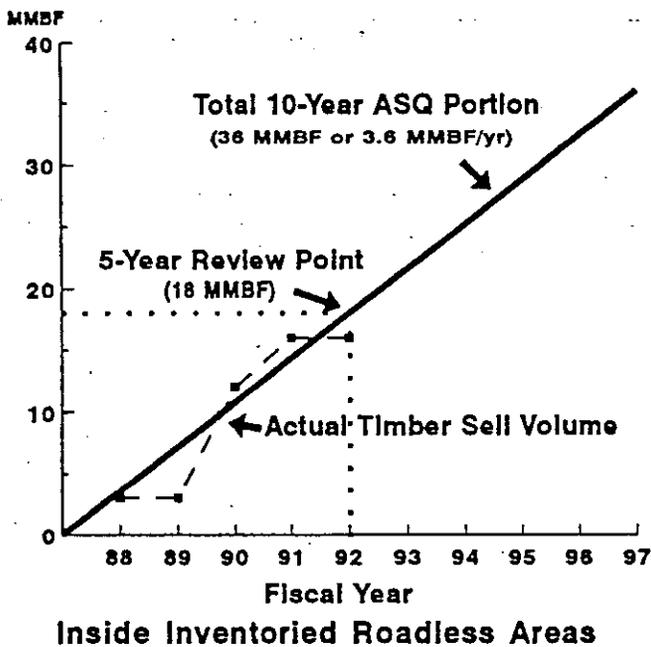


Table E-1-3 Timber Sell Volumes (MMBF) by T & E Species Habitat by Fiscal Year (FY)*

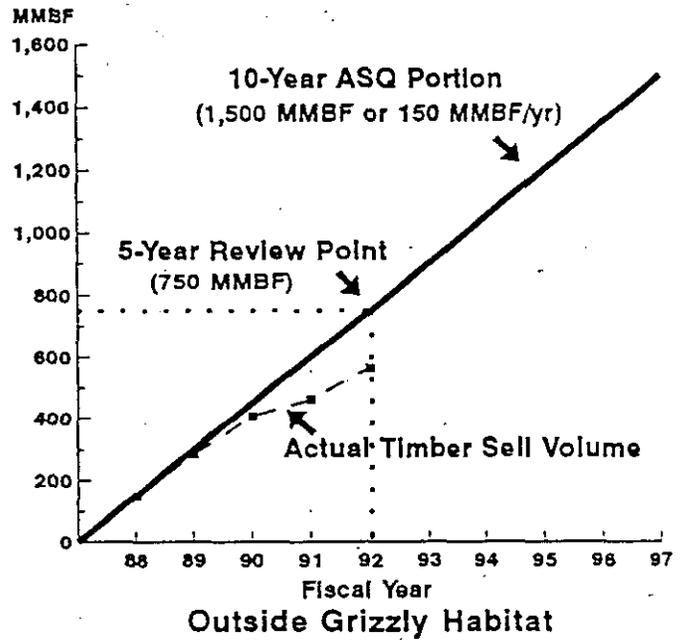
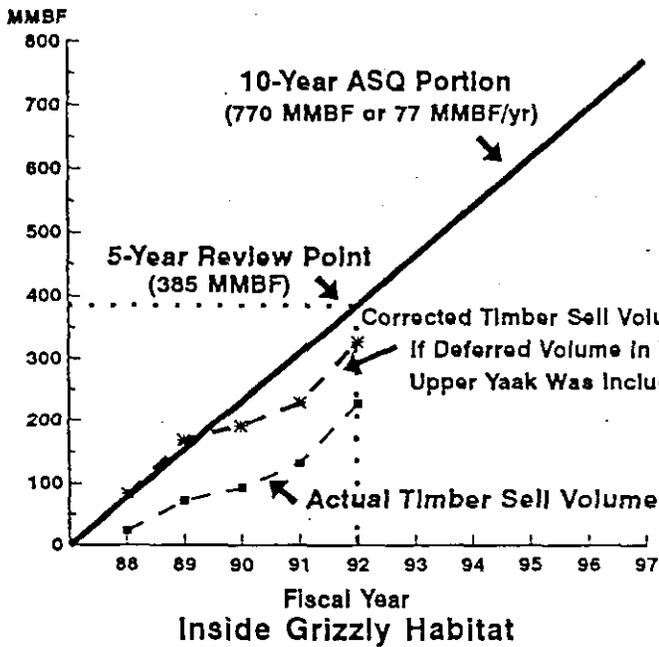
T & E Species Habitat	Annual Forest Plan Projection	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	Total 5-Year Timber Sell 1988-92	Average Timber Sell per FY	Percent of Annual Forest Plan Projection	5-Year Forest Plan Projected Sell	Difference From Forest Plan Projection
Grizzly Bear Habitat	77	24	47	22	38 ¹	97	228	46	59	385	-157 ²
Non-grizzly Habitat	150	149	134	124	56 ¹	102	565	113	75	750	-185
Total Sell, Suitable Lands	227	173	181	146	94¹	199	793	159	70	1,135	-342

* Some totals may not be exact because of rounding. ¹ Corrected to show sold and awarded volume.

² 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 (see Figure E-1-3, below). The deferrals were not due to grizzly bears.

Figure E-1-3

Projected and Actual Accumulative Timber Volume on Suitable Lands by T & E Species Habitat (Fiscal Years 1988-1992)



TIMBER

Acres Sold for Timber Harvest: Monitoring Item E-2

ACTION OR EFFECT TO BE MEASURED:	Determine if the regeneration harvest acres meet Forest Plan projections by management area.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	+/- 10% by management area after 5 years.

Purpose: This monitoring item was established to help ensure that the timber sale acreages and allowable sale quantity (ASQ) volumes sold are closely correlated. The Plan requires that this item be reported annually. The expected accuracy and reliability of the information is high.

Background: 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, budget requirements, or environmental effects. (For more information on the Forest Plan MA requirements, see Chapters II and III of the Forest Plan.)

The Forest Plan projects 15,740 acres of annual regeneration harvests to achieve the ASQ. Regeneration harvests include clearcut, seedtree, and shelterwood cutting methods.

Results: Table E-2-1 shows the acres sold for regeneration harvest by MA by fiscal year plus the 5-year average, and compares that average to the Forest Plan projection. The FY 1992 total of 5,622 acres is the lowest amount for the last five years. The average for MA-15 is 53% above the Plan's projected level while four other suitable timber MA's are significantly below in percentage accomplishment (MA's 12, 14, 16, 17). MA 12 has the largest average acreage deviation (a total of 4,652 acres which is 8,800 - 4,148).

Evaluation: MA-15 is primarily oriented to timber production, and other resources such as big game, visual quality, Threatened and Endangered (T & E) species, etc, have less significance. 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's expected that the high level of timber sales prepared to harvest lodgepole pine beetle-killed timber will continue for several more 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 33,000 acres in 1992).

The large acreage deviation in MA-12 (4,652 acres per year) is because of a combination of several factors. They are: the evolving interpretations of Forest Plan standards for grizzly bear management; the need to provide for wildlife security, displacement and hiding cover; and providing for a 10% minimum amount of old-growth habitat. See Monitoring Item E-7 for more information.

Finding: This monitoring item is outside the Plan's specified range (+/-10%).

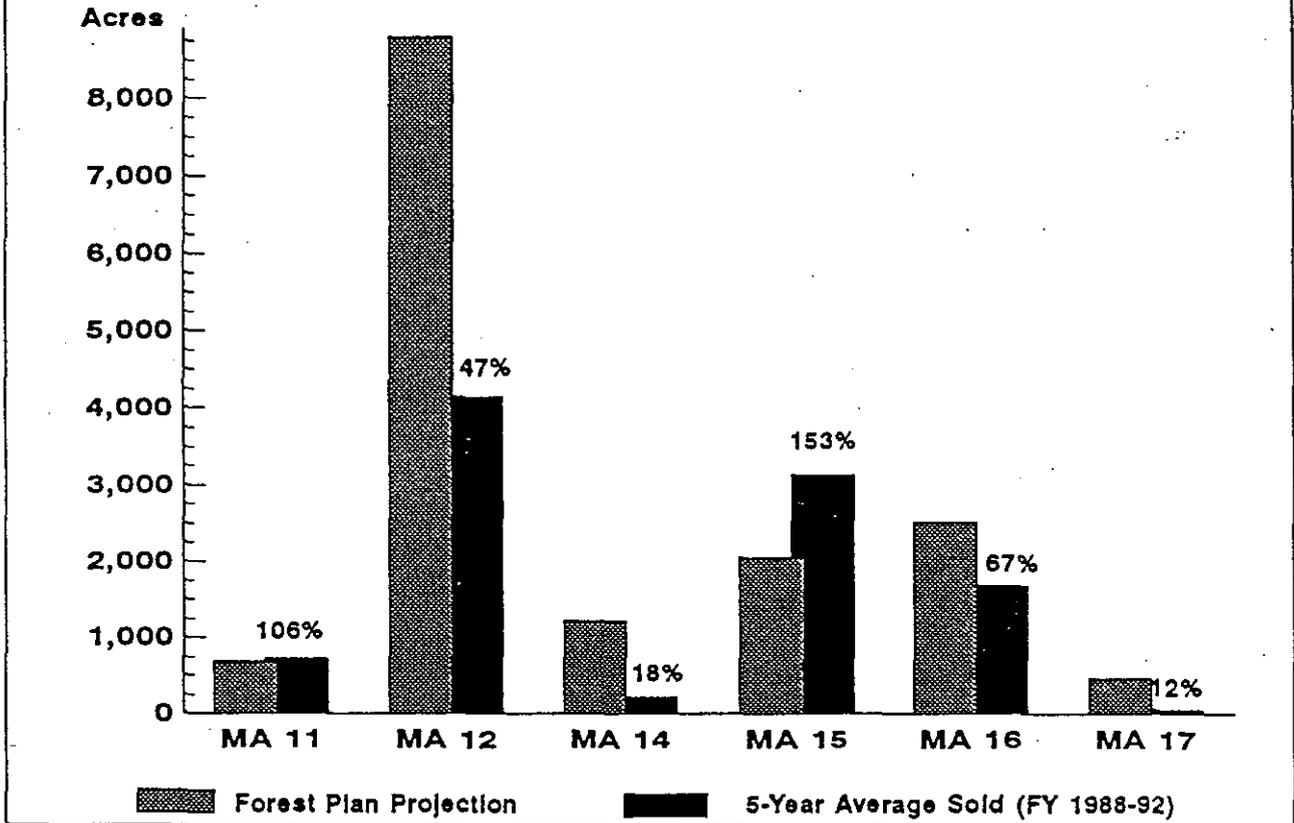
Table E-2-1 Acres Sold for Timber Harvest by Fiscal Year (FY)*

Management Areas (MA's)	Forest Plan Projected Acres	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	Average Sold per Year	Percent of Forest Plan Projection
11	690	696	665	831	772	698	732	106
12	8,800	6,518	5,431	3,729	1,911	3,155	4,148	47
14	1,220	170	139	142	535	136	224	18
15	2,050	3,513	4,574	3,790	2,258	1,560	3,139	153
16	2,520	325	416	277	2,294	58	1,685	67
17	460	55	10	47	137	15	53	12
Total	15,740	11,277	11,235	8,809	7,907	5,622	8,970	57

* Regeneration Harvest Methods Only

Figure E-2-1

Average Annual Acres Sold for Timber Harvest
(Regeneration Harvest Methods Only - Fiscal Years 1988-92)



TIMBER

Suitable Timber Management Area Changes: Monitoring Item E-3

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

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

Background: The allowable sale quantity (ASQ) calculated for the Plan is partially dependent on the amount of suitable timber acreage. This acreage is located within management areas (MA's) 11, 12, 14-17. These MA's are validated during site-specific project analysis. When inaccuracies 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 in suitable timberland for FY 1992. Also included are the results of the last five years (FY 1988-92) and the net change in suitable timberland. The largest changes in FY 1992 were in MA's 11 and 12 compared to FY 1991. These two MA's accounted for 12,457 acres which is 81% of the total FY 1992 change. Total net losses in the suitable timberland in FY 1992 are 16,185 acres which is a 257% increase over FY 1991.

Evaluation: The most significant changes in FY 1992 were the result of validating 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 five years for all the remaining (unsuitable) MA's on the Forest are also displayed in Table E-3-2. The bulk of the acreage gains in these unsuitable MA's, which offset the suitable timber acreage losses, were in MA-13 (old-growth), MA-10 (big-game winter range/unsuitable timber) and MA-24 (non-productive land).

For the last five years, the pattern of change has been consistent in both magnitude and direction. The magnitude of the reduction of suitable timberland started at a low level (less than 1,000 acres in FY 1988) and steadily increased to over 16,000 acres in FY 1992. The direction of change in suitable timberland has been consistent in that the validation of old-growth habitat and the identification of non-productive timberland in big-game winter range resulted in the most numerous changes needed. The total amount of changes made in all the MA's during the last five years is 61,000 acres. This includes map drafting errors found (incorrect MA number assigned or lines missing, etc.), errors identified on-the-ground (non-productive land identified as productive on the Forest Plan Map), and land exchanges completed (which required additions or subtractions of MA acreages).

As a result of the five years of cumulative change in suitable timberland, MA-11 and MA-15 are now beyond the -5,000 acres total change level shown in the Plan.

Finding: This monitoring item is outside the prescribed range for MA's 11 and 15 (more than a -5,000 acres change). The remaining suitable timber MA's are still on-track (MA's 12, 14, 16, 17).

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
1992	-9,279	-3,178	-196	-1,711	-1,498	-323	-16,185
Total Net MA Change	-10,177	-4,385	+80	-10,679	-2,528	-1,313	-29,002

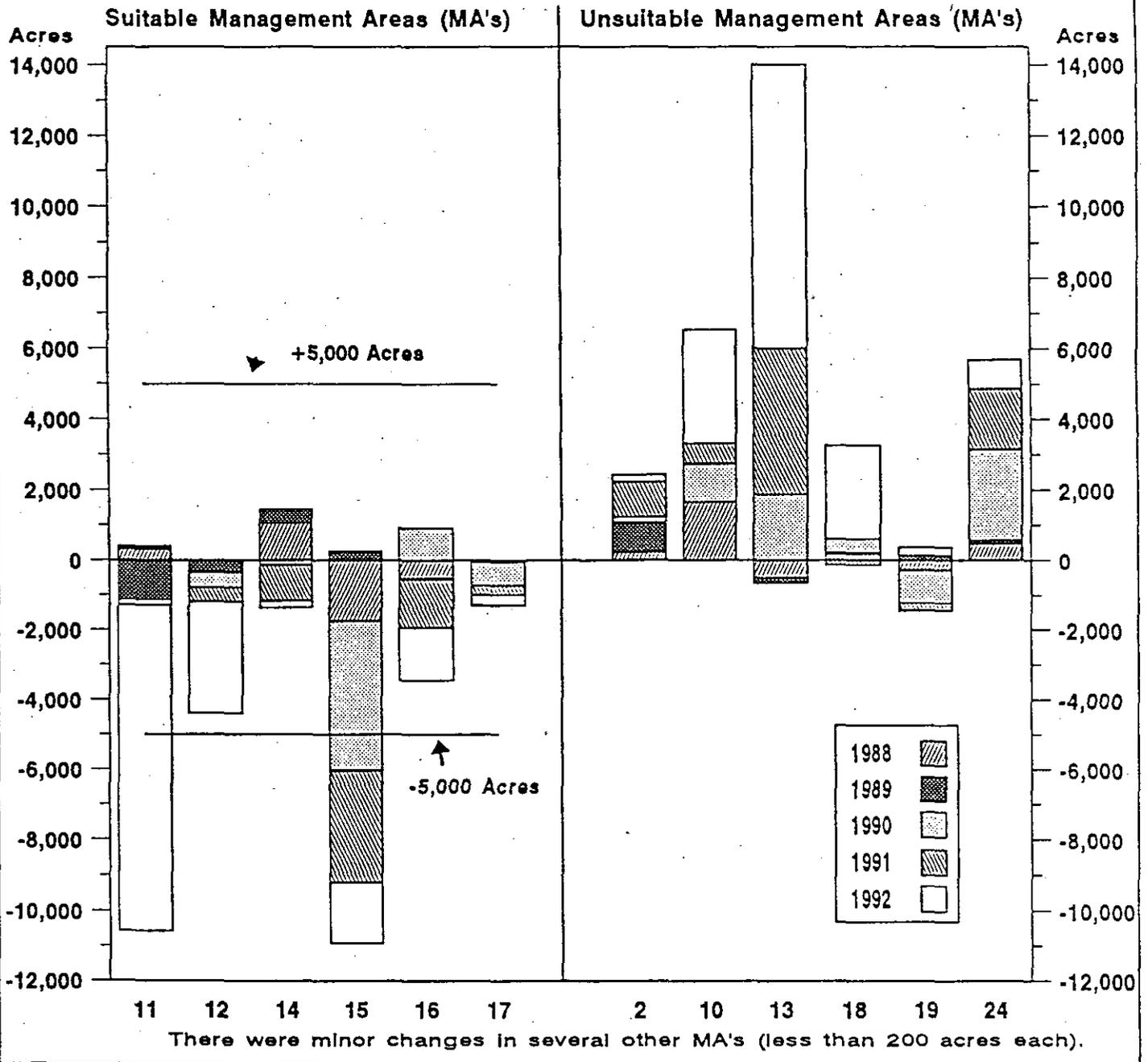
Table E-3-2 Net Acreage Changes by Management Areas (MA) in Unsuitable Timberland

Fiscal Year	MA 2	MA 10	MA 13	MA 18	MA 19	MA 24	Total Net Changes in Unsuitable Timberland
1988	+240	+1,670	-500	+190	-280	+480	+1,800
1989	+842	0	-149	+32	+135	+100	+960
1990	+150	+1,080	+1,877	+381	-950	+2,564	+5,102
1991	+1,009	+574	+4,135	-140	-231	+1,724	+7,071
1992	+196	+3,211	+7,980	+2,656	+231	+823	+15,097
Total Net MA Change	+2,437	+6,535	+13,343	+3,119	-1,095	+5,691	+30,030

Note: The differences displayed in the Fiscal Year totals and the Total MA Changes in the two Tables shown above are the result of eight additional unsuitable MA's which contain some minor acreage (usually less than 200 acres each), plus the lands that have been acquired and disposed of in the land exchanges completed during the last five years (about 2,300 net additional acres).

Figure E-3-1

MA Changes by Fiscal Year



TIMBER

Timber Growth Trends: Monitoring Item E-4

ACTION OR EFFECT TO BE MEASURED: Determine growth trends by timber productivity class (MIX CON I, MIX CON II, LPP) to validate the timber yield tables used in the Plan.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: +/- 10% of predicted volume by productivity class.

Purpose: This monitoring item was established to help ensure that the timber volumes predicted in the long-term harvest schedule are reasonable. The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is moderate to high.

Background: Growth trends are monitored with two types of surveys which are permanent growth plots and Timber Stand Improvement (TSI) Benchmark exams. Starting in FY 1983, 57 permanent growth plots were established representing pre-commercial and commercial thinning within the various productivity groups (Mix Con I, Mix Con II and LPP) and at stocking levels displayed in the Forest Plan Timber Yield Tables. These yield tables have been further defined (specific stand attributes such as trees per acre, tree heights, cubic feet growth, etc.) by the 'KNF Draft Habitat Type Groups and Target Stands' document in 1991. These target stands are being used as a standard to measure silvicultural treatments.

Ten percent of the stands pre-commercially thinned 10 years earlier are sampled annually with a TSI Benchmark exam (see KNF Post TSI Stand Exam program memo dated 1990). This currently measures silvicultural treatments prior to approval of the Forest Plan.

Results: The permanent growth plots remeasured in FY 1992 (four in Mix Con I and five in LPP) indicate the stands are within the parameters set out in the 'Target Stands' document for the appropriate stage of development (age). The actual height growth measured compared to the prognosis projections show that the remeasured stands are exceeding the height projections by 10%.

TSI Benchmark Plots measured in FY 1991 (seven in Mix Con I, eight in Mix Con II and seven in LPP) represent TSI prior to FY 1981. They indicate timber yields were within the anticipated range stated in the 'Target Stands' document but at the low to mid-range because of mortality caused by animals (bears, squirrels, etc.) and diseases (root rot, western gall rust, etc.). These results have been found to be common to stands thinned prior to FY 1982 and will limit the future possibility of commercial thinning. **NOTE:** Commercial thinning volumes were not estimated in the Forest Plan ASQ calculations.

Newly established plots (three in Mix Con I and two in Mix Con II) measuring multi-story target stands indicate a 10%-25% reduction in volume when compared to the Plan's even-aged single-storied stands. However, these multi-story stands were not modeled in the Plan's yield tables, so such studies are directed more toward future yield tables.

Evaluation: The measurements and remeasurements to date indicate that the Forest Plan Timber Yield Tables are still reasonable for even-aged regeneration harvesting. However, the work with Target Stand modeling and the new program of ecosystem management indicate that modified or entirely new yield tables will be required for future Forest Plans.

Finding: The monitoring item is within the range prescribed in the Plan.

TIMBER

Reforestation: Monitoring Item E-5

ACTION OR EFFECT TO BE MEASURED:

Determine acres of reforestation and survival to track the Plan's projections and insure that NFMA requirements are being met.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:

+/- 10% of predicted regeneration acres.

10% of the stands are not certified as regenerated within 5 years after final harvest (5 years after clearcutting, or 5 years after the overstory has been removed after a seedtree or shelterwood cut).

Purpose: This monitoring item was also established to help ensure that the allowable sale quantity (ASQ) is reasonable. The Plan requires that this item be reported every five years. The expected accuracy and reliability of the information is high.

Background: The Forest Plan estimates that about 14,100 acres per year will require reforestation assistance measures to achieve successful regeneration. These acres need to be promptly reforested to ensure that predicted future timber growth levels can be achieved. Prompt reforestation is also needed to meet the requirements of the National Forest Management Act (NFMA) which directs that it be accomplished within five years after the final harvest of trees on a site. The reforestation can be accomplished by using natural regeneration methods (seedfall from adjacent seedtrees), artificial regeneration methods (planting of nursery-grown seedlings) or a combination of both methods. Site preparation for both the natural seedfall or planting is an integral part of the total reforestation job.

Results: Table E-5-1 displays the results of the last five years of reforestation activities. The acreage has ranged from 11,500 acres in FY 1988 to 15,000 acres in FY 1991. The total acreage reforested is 63,400 acres and the amount of replanting was 2,400 acres.

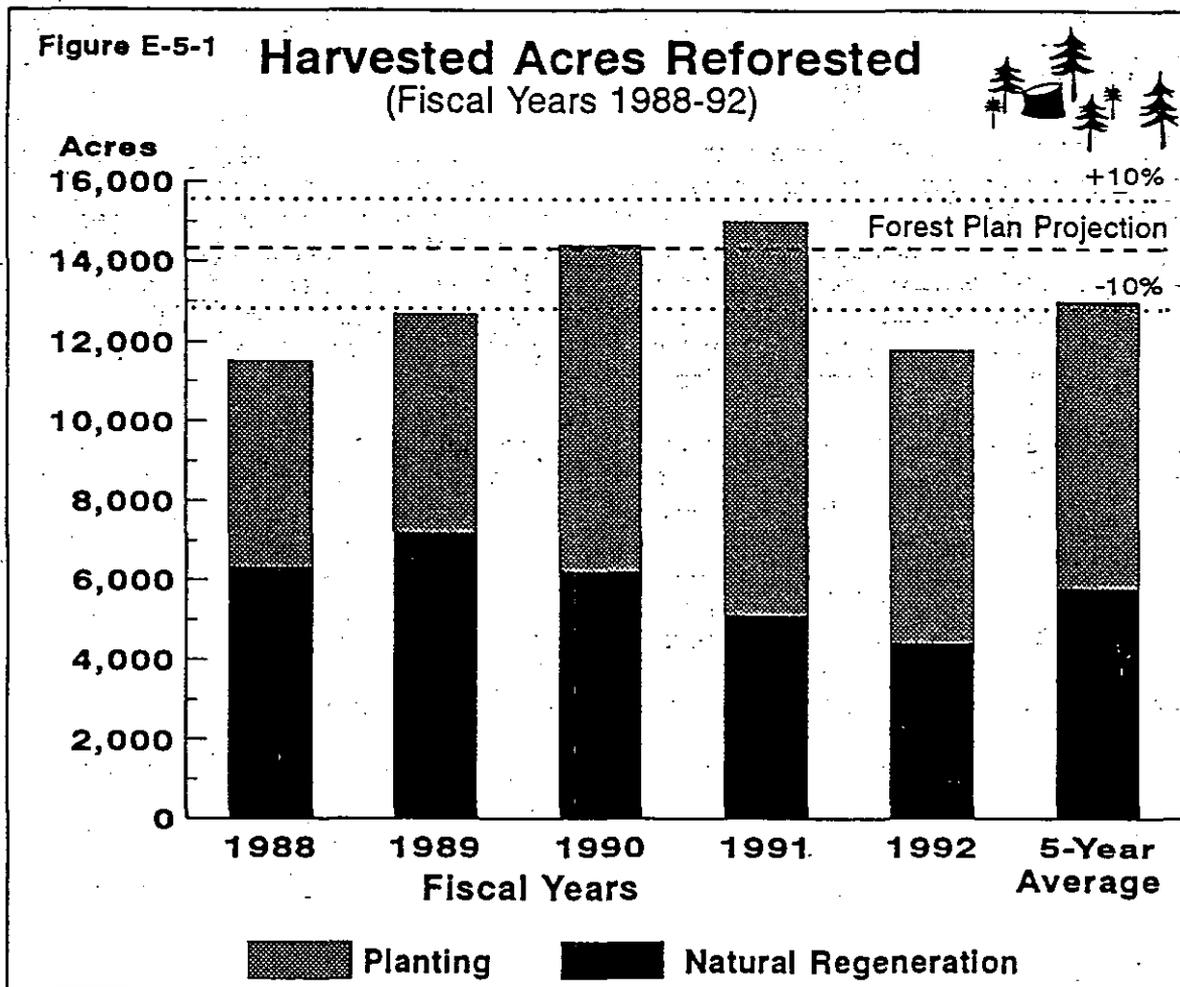
Evaluation: The total acreage reforested has increased each year from FY 1988 with the exception of FY 1992. The 5-year average of 12,700 acres is within the +/- 10% range prescribed in the Plan (12,700 to 15,500 acres). The 5-year average of the percent survival on the reforested acreage is 96%.

Finding: Based on the information stated above, the monitoring item is on-track.

Table E-5-1 Harvested Acres Reforested and Survival

Fiscal Year	Natural Regeneration	Planting	Total Reforestation ¹	Replanting	Percent Survival ²
1988	6,300	5,200	11,500	300	97
1989	7,200	5,500	12,700	300	98
1990	6,200	8,200	14,400	700	95
1991	5,100	9,900	15,000	400	97
1992	4,400	7,400	11,800	700	94
Totals	29,200	36,200	63,400	2,400	96
Average	5,800	7,200	12,700	500	96

¹ The Forest Plan projection is 14,100 acres per year. ² The Forest Plan limit is 90%.



TIMBER

Timber Stand Improvement (TSI): Monitoring Item E-6

ACTION OR EFFECT TO BE MEASURED: Determine acres of TSI to see if the Plan's targets are being met.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: +/- 20% of predicted TSI acres.

Purpose: This monitoring item was also established to help ensure that the allowable sale quantity (ASQ) is reasonable. The Plan requires that this item be reported every five years. The expected accuracy and reliability of the information is high.

Background: The Forest Plan estimates that 5,000 acres of Timber Stand Improvement (TSI) activities will be needed each year to achieve the future timber growth levels predicted. TSI activities are primarily pre-commercial thinning and release operations. This consists of deliberately cutting unwanted tree saplings, which are about 10-20 years old, to provide a more optimum spacing and species mix. TSI is done on those stands where the number of tree saplings exceed a desirable maximum (about 600 trees per acre). If pre-commercial thinning is not done in some species of overstocked stands such as lodgepole pine, the risk is very high for stagnation because of overcrowding of all the saplings in the stand.

Results: Table E-6-1 displays the results of the last five years of TSI operations. The accomplishments total 20,300 acres and average 4,100 acres per year.

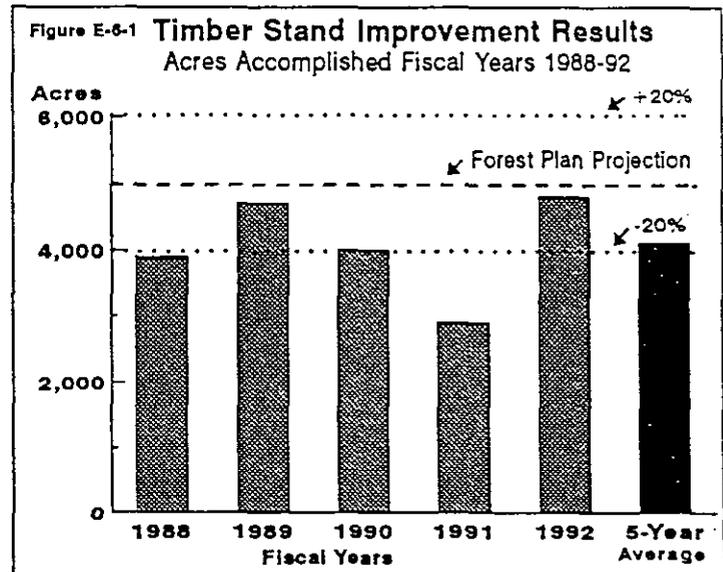
Evaluation: The amount of TSI work accomplished has been variable, depending on available workforce and budget. At the end of five years, this monitoring item is within the +/- 20% range prescribed in the Plan (from 4,000 to 6,000 acres).

Finding: Based on the information stated above, the monitoring item is on-track.

Table E-6-1 TSI Results¹

Fiscal Year	TSI Acres
1988	3,900
1989	4,700
1990	4,000
1991	2,900
1992	4,800
Total	20,300
Average ²	4,100

¹ The Forest Plan projection is 5,000 acres per year.
² The Forest Plan limit is 4,000 to 6,000 acres per year average.



TIMBER

Timber Harvest Deferrals: Monitoring Item E-7

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

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: More than 10,000 acres cumulative change in any suitable management area (MA) after 5 years.

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

Background: To determine the effect of harvest deferrals on the timber sale program, monitoring is done in two different categories. **Category A** deferrals are those that result from our project-specific conclusions about resource or economic conflicts that were not adequately accounted for in the Forest Plan. Examples are: road construction that is too expensive; or a threatened, endangered, or sensitive species found which was unknown during Forest Planning. **Category B** deferrals are those that result from an externally-imposed situation. Examples include: appeals and court injunctions, or significant timber harvest on adjacent private land which could cause cumulative watershed damage if the Kootenai Forest timber is harvested before adequate watershed recovery occurs on the private land. Please note that suitable timber acres rescheduled from one year to a later year within the 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 1988-92. The FY 1992 results show harvest deferrals occurred only in Category A. Even though no deferrals occurred in Category B during FY 1992, the total combined acreage of both categories (7,214 acres) is the highest of the last five years and a reversal of the downward trend that began in FY 1990.

Evaluation: In Category A, over 7,200 acres were deferred during FY 1992. This is the highest level of the last five years and is more than the previous four years combined. Timber sale design changes to provide for wildlife security, displacement, and hiding cover accounted for the majority of the acreage (5,135 acres or 71%). Other major reasons reported were: old-growth validation efforts that identified shortages from the required 10% level (657 acres), and losses from two large fires (516 acres).

In Category B, no acreage was deferred during FY 1992. This continues the downward trend in this category that started in FY 1989.

Summary: For FY's 1988-92, MA 12 shows 15,894 acres deferred. This is the largest amount of all the MA's, and is beyond the prescribed range of 10,000 acres. The grand total cumulative deferred MA acreage for both categories is now 24,287 acres. As a note of interest, the total amount deferred for harvest during the last five years as a result of appeals and litigation is 6,465 acres.

Finding: Based on the information stated above, the monitoring item is off-track for MA 12. The remaining suitable timber MA's are still on-track (MA's 11, 14-17).

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
1992	66	4,886	2,186	76	0	0	7,214
Subtotal Category A	469	10,068	2,746	430	496	0	14,209
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
1992	0	0	0	0	0	0	0
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
1992	66	4,886	2,186	76	0	0	7,214
MA Totals for FY's 1988-92	1,077	15,894	3,383	3,101	744	88	24,287

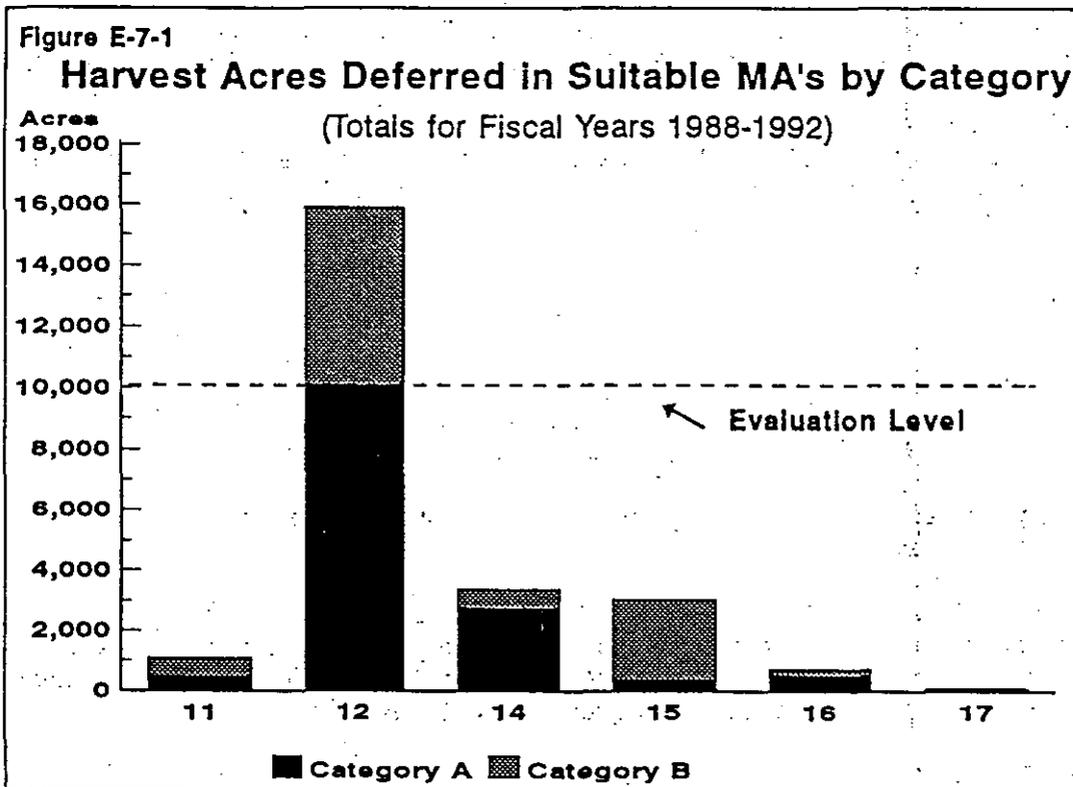
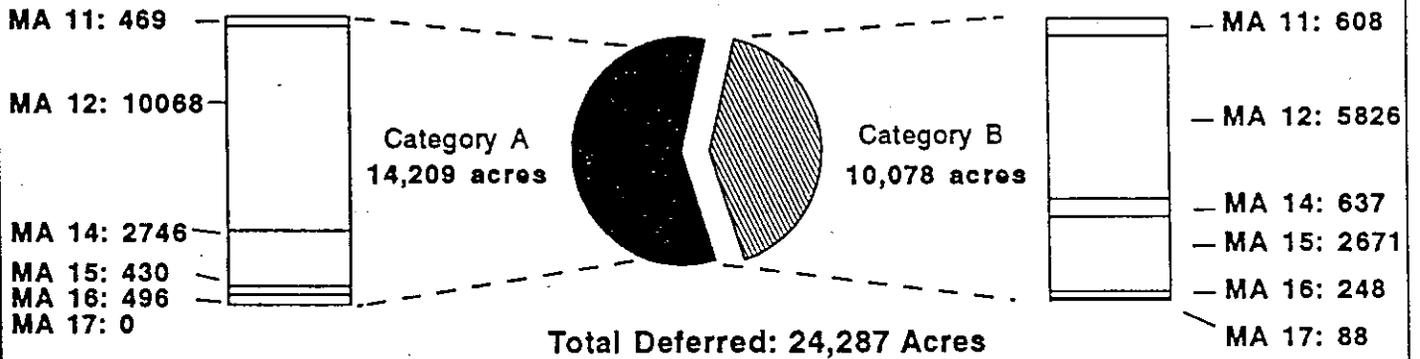


Figure E-7-1a:

Harvest Acres Deferred in Suitable Timber MAs

Total Acres for Fiscal Years 1988-1992



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

Purpose: This monitoring item was established to help ensure that the maximum regeneration harvest sizes permitted in the Plan are not exceeded without appropriate documentation. The permitted regeneration harvest sizes are 20 acres in Management Area (MA) 11 and 40 acres in MA's 12, 14-17. The Plan requires that this item be reported every two years. The expected accuracy and reliability of the information is high.

Background: The Forest Plan provides standards and guidelines for timber harvest area sizes for individual management areas (MA's). These harvest area limitations are primarily for regeneration harvest methods which are clearcutting, seedtree cutting and shelterwood cutting. The purpose is to provide a balance for all the major resources emphasized in each of the specific MA's. In MA 11, for example, regeneration harvest area size is specified to not exceed 20 acres to provide for moose and whitetail deer. In MA 12, the regeneration harvest area size is specified to not exceed 40 acres to provide for elk. In other MA's, no specific guides are given but regeneration harvest area sizes need to be consistent with other management objectives for the MA.

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

Results: Table E-8-1 displays the Forestwide average harvest area size in acres for each MA by harvest method. The time period shown is the last five years from 1988-92 including a 5-year average. The harvest methods displayed are clearcutting, seedtree cutting, shelterwood cutting, and all other harvest methods. Clearcutting generally leaves a few scattered live and dead trees per acre for cavity-nester use; seedtree cutting leaves about 4-8 trees per acre for natural seeding; shelterwood cutting leaves about 9-15 trees per acre for natural seeding and environmental protection such as shading. The other harvest methods include overstory removal, salvage, sanitation, thinning, preparatory cuts, and other intermediate silvicultural treatments that do not significantly open the forest canopy. Because of their more limited impact compared to the regeneration harvest methods, these other harvest methods do not have any acreage restrictions for harvest area size.

Appendix B-2 lists the harvest areas resulting in larger-than-40-acre openings approved during FY 1992, as well as an estimate of how long it will take for the vegetation to regrow adequately to provide adequate big-game hiding cover. There were 19 resultant openings greater than 40 acres approved by the Forest Supervisor or Regional Forester. Most of these were in response to the catastrophic results of the October, 1991 fire and windstorm. In most cases, the newly-created openings were contiguous with an existing harvest unit. In the case of these combined openings with a previous harvest unit, about 10-12 years are needed for the vegetation to regrow adequately to provide adequate big-game hiding cover. This is because of the existence of adjacent vegetation that is already well established. Where new harvest openings are

isolated, it's expected that about 15-20 years are needed to regrow adequately because of the lack of advanced adjacent vegetation.

Evaluation: Figure E-8-1 shows that the 5-year average harvest area size by regeneration harvest method is less than 20 acres in MA 11 and less than 40 acres in MA's 12, 14-17.

Finding: Based on the information stated above, the monitoring item is in compliance.

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

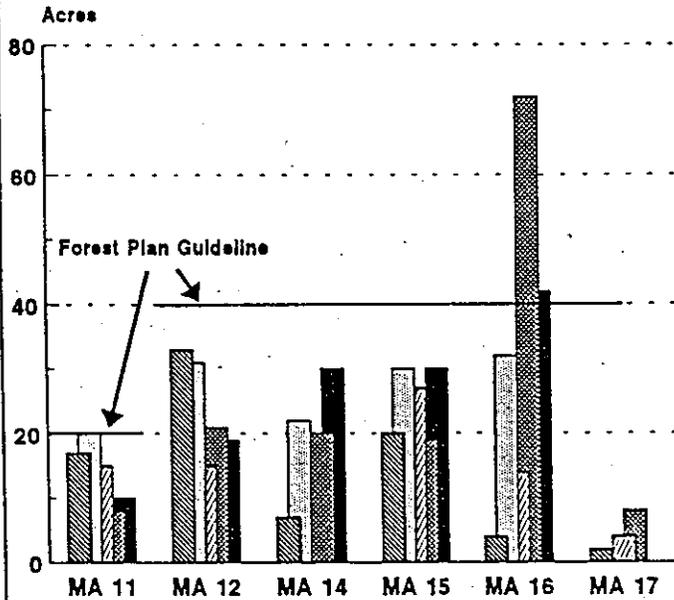
Harvest Method and Fiscal Year	MA 11	MA 12	MA 14	MA 15	MA 16	MA 17
Clearcutting						
1988	17	33	7	20	4	2
1989	20	31	22	30	32	0
1990	15	15	0	27	14	4
1991	8	21	20	19	72	8
1992	10	19	30	30	42	0
5-Year Average	14	24	16	25	33	3
Seedtree Cutting						
1988	15	39	12	37	15	13
1989	8	30	16	30	34	0
1990	33	20	24	35	16	20
1991	23	22	17	32	20	18
1992	14	18	32	31	1	0
5-Year Average	19	26	20	33	17	10
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
1992	24	31	25	0	14	15
5-Year Average	20	22	12	19	14	3
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
1992	28	48	20	38	35	45
5-Year Average	33	47	42	35	46	33

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

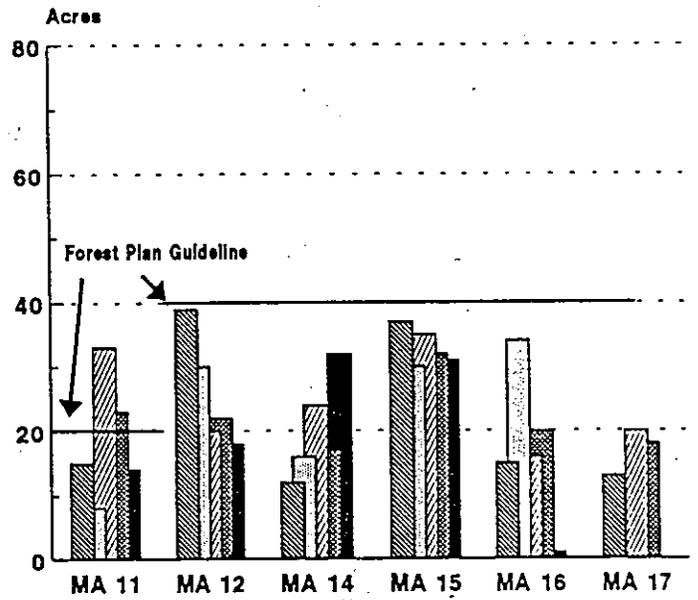
Figure E-8-1

Average Harvest Area Size by Harvest Method (Fiscal Years 1988-1992)

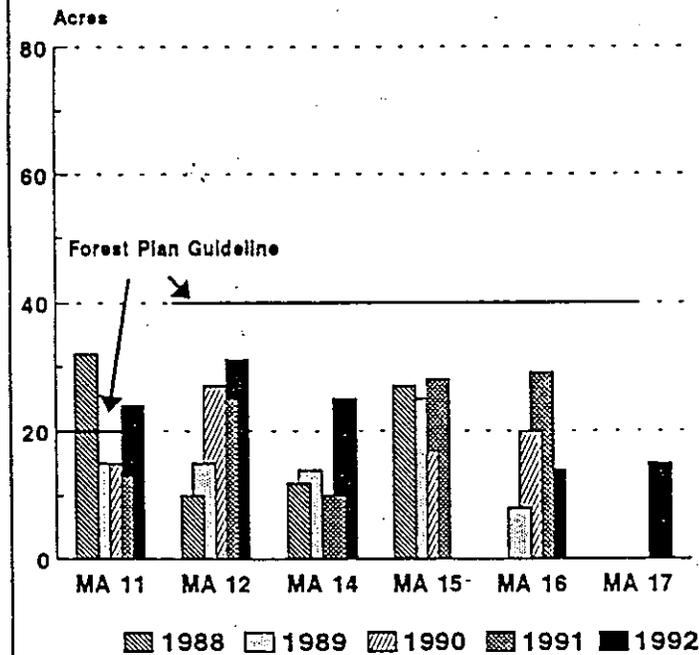
Clearcut Harvest Units



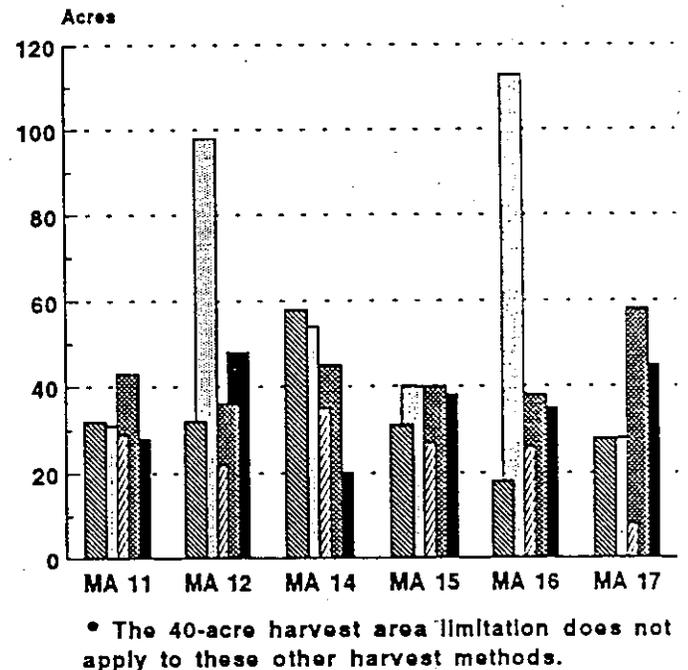
Seedtree Harvest Units



Shelterwood Harvest Units



Other Harvest Units *



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

TIMBER

Clearcut Acres Sold: Monitoring Item E-9

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

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Not defined.

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

Background: Congress has directed the Forest Service to reduce the amount of clearcut harvesting by 25% by 1995. The purpose of this is the increasing concern with clearcutting on the National Forests. The baseline year for this comparison is FY 1989. The Chief of the Forest Service has added to this congressional directive and requested that clearcutting be reduced by at least 70% by 1997. The baseline year for the Chief's comparison is FY 1988. Because of the similarities of these two directives and the similar results for FY's 1988-89, the baseline year of FY 1988 is being used for both comparisons.

Results: Table E-9-1 displays the results since FY 1988. As can be seen, the acres of clearcut harvest sold has been reduced in each of the last three years beginning with FY 1990.

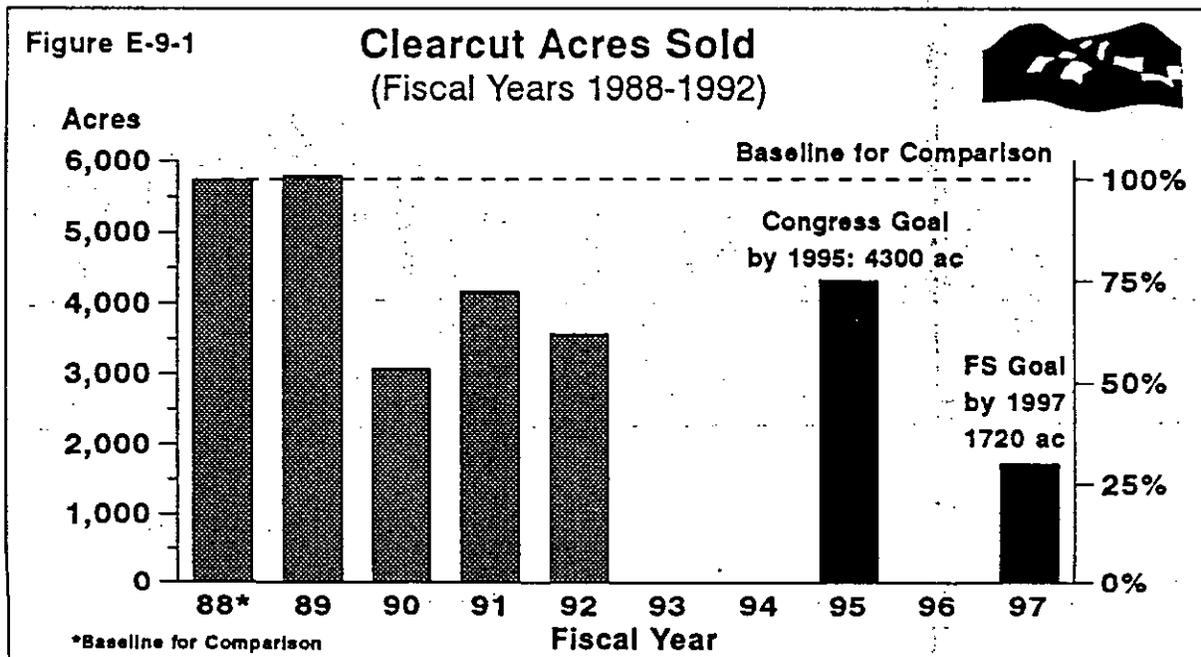
Evaluation: The Forest is contributing to: the congressional direction to reduce the amount of clearcutting by 25% by 1995 and, the Chief's request for a 70% reduction in clearcutting by 1997.

Finding: Based on the information stated above, the monitoring item is on-track.

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

Item	FY 88 ¹	FY 89	FY 90	FY 91	FY 92
Clearcut Acres Sold	5,734	5,795	3,068	4,159	3,557
% Reduction From 1988	NA	None	-46	-27	-38

¹ FY 1988 is the baseline year for comparison.



SOIL AND WATER

Soil and Water Conservation Practices: Monitoring Item F-1

ACTION OR EFFECT TO BE MEASURED: Determine if regional and project soil and water practices meet State Water Standards.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: Failure to meet State Standards.

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

Background: The Forest has been monitoring the Soil and Water Conservation Best Management Practices (BMP's) since 1988. 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 such as sediment which is the primary source of non-point pollution on the Forest. 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.

Projects that are evaluated for BMP implementation and effectiveness include timber sale road construction, timber harvest, mine site rehabilitation, and other activities that expose or disturb soil.

Fiscal Year 1992 BMP monitoring on the Forest involved two different efforts: BMP monitoring done by Kootenai Forest personnel during their normal work activities, and BMP monitoring done by the Montana Department of State Lands (Forestry Division) as part of a larger Statewide BMP audit. In both of the efforts, BMP's were evaluated at particular sites on various projects across the Forest. 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
Acceptable or Better	Operation Meets Requirements	Adequate or Improved Protection of Soil and Water Resources
Unacceptable	Minor Departure From Intent	Minor and Temporary Impact
Very Unacceptable	Major Departure From Intent	Major and Temporary, or Minor and Prolonged Impact
Grossly Unacceptable	Gross Neglect or No Application At All	Major and Prolonged Impact

Results of BMP Monitoring Done by Kootenai Forest Personnel: There were 122 separate projects audited in FY 1992 by KNF personnel. Implementation evaluations were completed for 3,845 BMP's which is an increase of over 200% from FY 1991. IMPLEMENTATION evaluations met the requirement of acceptable 93% of the time. EFFECTIVENESS evaluations were completed for 1,212 BMP's and met the requirement of acceptable 86% of the time (see Table F-1-2).

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

RATING	IMPLEMENTATION (%)			EFFECTIVENESS (%)		
	FY 90	FY 91	FY 92	FY 90	FY 91	FY 92
Acceptable or Better	96	96	93	91	88	86
Unacceptable	4	3	6	8	12	13
Very Unacceptable	0.4	1	0	1	0	2
Grossly Unacceptable	0	0	0	0	0	0

* Totals are not exact because of rounding.

Evaluation of BMP Monitoring by Kootenai Forest Personnel: The results of the FY 1992 BMP monitoring can be compared to those made for the two preceding fiscal years (see Table F-1-2). During FY 1992, ratings were similar but lower than the preceding two years for both IMPLEMENTATION and EFFECTIVENESS evaluations (93% for acceptable to 96% previously for IMPLEMENTATION evaluations, and 86% for acceptable compared to 88% and 91% previously for EFFECTIVENESS evaluations).

The most frequent violation involved a BMP regarding tractor operations in wet areas (BMP #13.03). This BMP was unacceptable on 14 occasions.

The decrease in the percentage of acceptable or better ratings from prior years may indicate that a more concerted effort is needed in training and followup for the on-the-ground personnel responsible for BMP compliance.

Results of BMP Monitoring Done by the State BMP Audit Team: In FY 1992, four timber sales with 195 BMP's were monitored as part of the statewide Montana Forestry Best Management Practices Implementation Monitoring Program. These audits were conducted under the supervision of the Montana Department of State Lands by an interdisciplinary team comprised of a fisheries biologist, a forester, a hydrologist, a representative of a conservation group, a logging/road engineer, and a soil scientist. The previous State BMP Audit done on the Kootenai Forest was in FY 1990. That audit evaluated six projects with 221 BMP's.

The FY 1992 State BMP Audit done on the Forest evaluated a total of 195 BMP's on four separate projects. IMPLEMENTATION evaluations met the requirements of acceptable or better 83% of the time and 17% were unacceptable or worse. EFFECTIVENESS evaluations met the requirements of acceptable or better 86% of the time and 14% were unacceptable or worse (see Table F-1-3). These two ratings were below the Statewide average of 87% acceptable or better for IMPLEMENTATION and 90% acceptable or better for EFFECTIVENESS. The results of these audits are displayed in Table F-1-3.

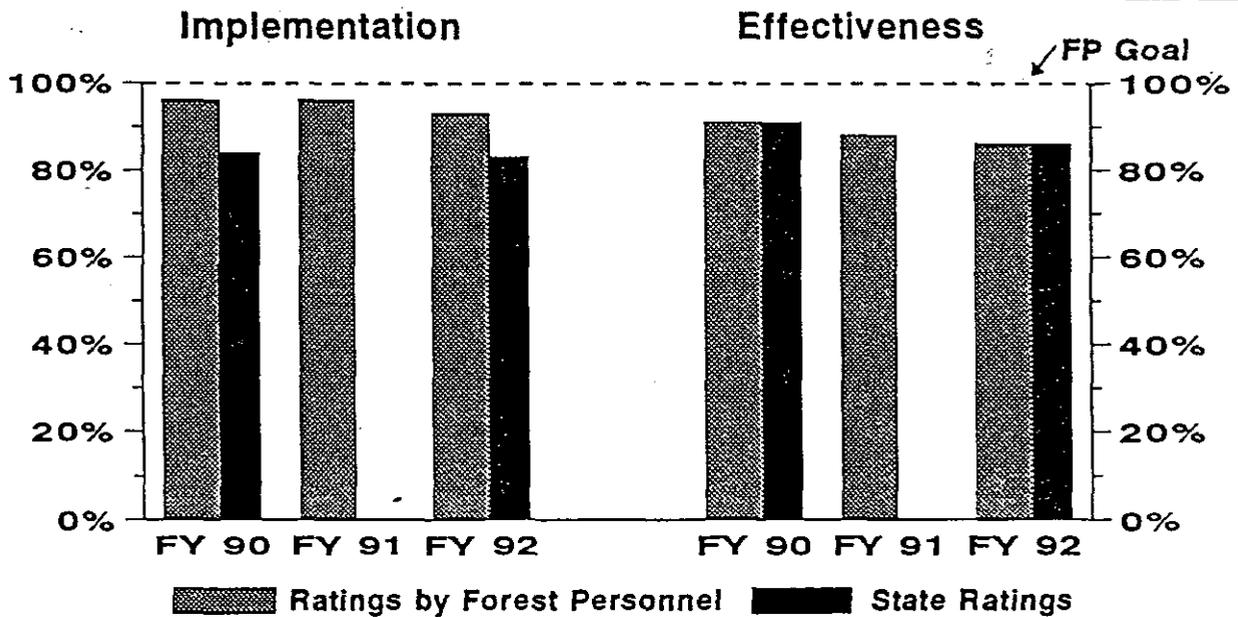
Table F-1-3 BMP Monitoring Results by State BMP Audit Team*

RATING	IMPLEMENTATION (%)			EFFECTIVENESS (%)		
	FY 90	FY 91	FY 92	FY 90	FY 91	FY 92
Acceptable or Better	84	NA	83	91	NA	86
Unacceptable	13	NA	10	8	NA	7
Very Unacceptable	3	NA	6	1	NA	6
Grossly Unacceptable	0	NA	1	0	NA	2

* Totals are not exact because of rounding.

Figure F-1-2/3

BMP Monitoring Results of Acceptable or Better
(Fiscal Years 1990-92)



The State BMP Audit Team also evaluated the sensitive or "high-risk" BMP's and how they compared to the statewide average. The "high-risk" BMP's are those that are considered to be the most important in protecting watersheds and water quality. In this sensitive BMP category, IMPLEMENTATION results were 50% acceptable compared to the Statewide average of 72%. EFFECTIVENESS results were 65% acceptable compared to 77% for the Statewide average.

Evaluation of the Statewide BMP Audit Team Results: The FY 1992 BMP Audit results for the Kootenai Forest are lower than the Statewide results for the IMPLEMENTATION and EFFECTIVENESS categories. This is a decrease from the FY 1990 BMP Audit where the Kootenai Forest results were higher than the Statewide average. **NOTE:** The State BMP Audit was done on one harvest unit in each of four separate timber sale areas. Almost half of the unacceptable-or-worse BMP ratings were received on a harvest unit audited in a timber sale that was having contract administration problems.

When comparing the "high risk" BMP's in FY 1992, the ratings for both the IMPLEMENTATION and EFFECTIVENESS categories were also lower than the Statewide average. ("High Risk" BMP's are those that are considered to be especially important to the protection of water quality.) This again is a decrease from the "high risk" BMP's in FY 1990 which were higher than the Statewide average.

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

SOIL AND WATER

Stream Sedimentation: Monitoring Item F-2

ACTION OR EFFECT TO BE MEASURED: Determine sediment impacts on fishery habitat.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: 20% increase in bedload and suspended solids.

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

Background: The Forest Plan identified seven streams that would be monitored as indicators of forestwide change. They are: Big, Sunday, Bristow, Red Top, Rock, Granite and Flower Creeks. The data to be collected was to include bedload sediment movement, suspended solids concentrations and streamflow. This data is to be used to help establish the range in variation of background levels for the seven Forest Plan Monitoring streams.

Results: The seven "forestwide change" indicator streams are displayed in Table F-2-1 with a summary of the activities accomplished during FY 1992.

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

Drainage Name	Channel Cross-Section	Crest Gage	Suspended Sediment	Flow Measurements	Other	Total Number of Monitoring Stations
Big Creek ¹⁰	Yes	Yes	Yes ¹	Yes	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 ⁶
Granite Creek	Yes ⁷	No	Yes	Yes ⁸	No	1
Flower Creek	No	No	Yes	Yes ⁹	No	3

¹ Two automatic suspended sediment samplers were installed for part of the year.

² Channel stability, riffle armour stability index (RASI) and Rosgen surveys.

³ Macro-invertebrate sampling, Redd count, RASI and Thalweg (T-Walk) surveys.

⁴ Riparian mapping, channel stability, Rosgen and fish population surveys, bedload sampling.

⁵ Chemical analysis of water samples, substrate core sampling and embeddedness surveys.

⁶ All data collected by Hydrometrics, a consulting firm for Asarco Inc.

⁷ Channel cross-sections were done in 1989 and are planned for 1993.

⁸ Stream flow station is operated by the U.S. Geological Survey.

⁹ Recording flow station.

¹⁰ Only sub-drainages are monitored in this stream.

Evaluation: The data collected is inconclusive in allowing us to determine if a 20% increase over natural background levels has been surpassed in bedload and suspended solids. The purpose of the monitoring item will be re-evaluated in the 5-year review because of undefinable affects of natural variation.

Finding: Based on the information stated above, this monitoring item is inconclusive.

SOIL AND WATER

Water Yield Increases: Monitoring Item F-3

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

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

Background: Water yield estimations for project planning utilize the Kootenai Forest water yield model which calculates the peak flow increase over natural conditions for a watershed or sub-watershed. The results are displayed on a percentage-increase basis and include past and proposed activities on both the public and private lands. If the calculated peak flows exceed acceptable limits, stream channel damage can probably be expected. Monitoring of water yield estimates is done to identify the 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 1992, the Kootenai water yield model was used to estimate the peak flow increase on 143,000 acres which included both National Forest and private land (see Table F-3-2). Of this total area analyzed, 29% of the acres exceeded the Forest water yield guidelines under present conditions. This high percentage reversed the declining trend that began in FY 1990 (see Figure F-3-2). One of the reasons for the reverse in declining trend is the result of watersheds that were analyzed after recent large wildfires.

Evaluation: The combined totals for FY's 1988-92 show that of the 1,530,600 acres analyzed for peak flow increases on both public and private land, 26% exceed the limits for water yield increase under present conditions. This is no change from last fiscal year.

NOTE: Because of the concerns being expressed for adequate water quality protection, a preliminary review of over 750 watersheds was recently completed (see Appendix E). This review included almost 2,706,000 acres of both public and private lands within the Forest boundary. The results indicate that about 12% of this total combined acreage is in an unacceptable hydrologic condition and that another 29% is close to, or at, the critical threshold of acceptable hydrologic condition. This suggests that 41% of the total combined Forest area has limitations to further developmental activity in the near future (such as timber harvest and road construction). The amount of suitable timberland involved on the Kootenai Forest within this identified area is 457,000 acres which is 36% of the total suitable timber (1,263,000 acres).

Summary: Most of the area analyzed in this monitoring item 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 (48% 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 Kootenai Forest lands. As discussed in Monitoring Item E-7 (Harvest Deferrals), the Forest has deferred harvest for this reason during 1988-1992. These deferrals for watershed limits have significantly reduced timber sale opportunities on the Fisher River District (see Figure F-3-3).

As stated above, these intermingled private land areas are primarily located in the southeast corner of the Forest where the Montana Cumulative Watershed Effects Cooperative has agreed to evaluate future 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.

Finding: Based on the information stated above, this monitoring item is currently outside the prescribed range of 20%.

Table F-3-1 Watersheds Analyzed by Ranger District, FY's 1988-92 (includes private land)

Ranger District	Total Acres of Watersheds Analyzed	Acres of Watersheds Exceeding Water Yield Guidelines	Percent ¹
Rexford	166,600	7,710	5
Fortine	127,000	18,900	15
Three Rivers	424,400	49,700	12
Libby	173,200	50,900	29
Fisher River	544,760	262,400	48
Cabinet	94,600	0	0
Totals ²	1,530,600	398,600	ave. 26

¹ The Forest Plan Limit is 20%. ² Totals are rounded.

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 ¹
1988-89	976,020	328,990	34
1990	158,880	14,560	9
1991	252,400	13,020	5
1992	143,300	42,000	29
Totals ²	1,530,600	398,600	ave. 26

¹ The Forest Plan Limit is 20%. ² Totals are rounded.

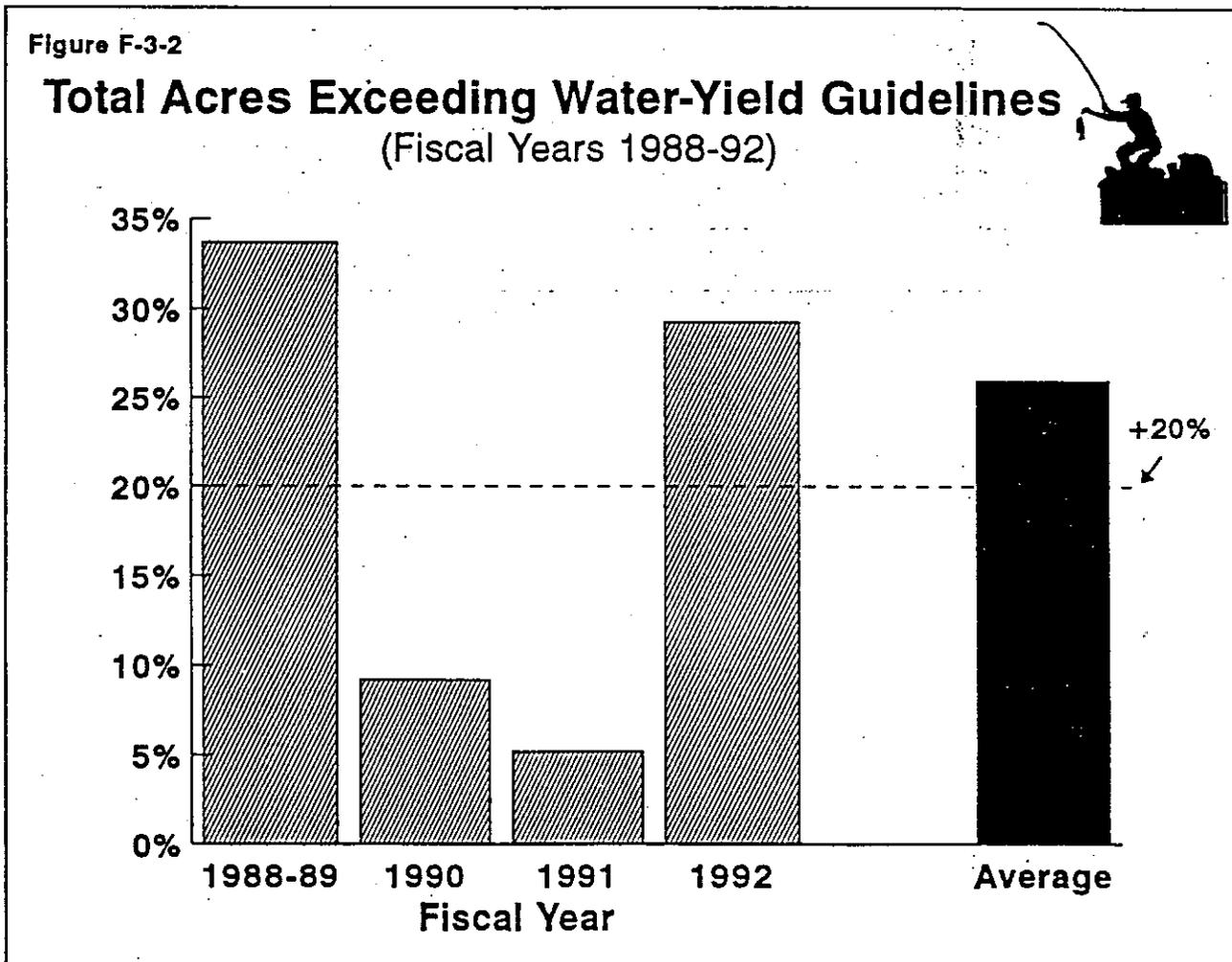
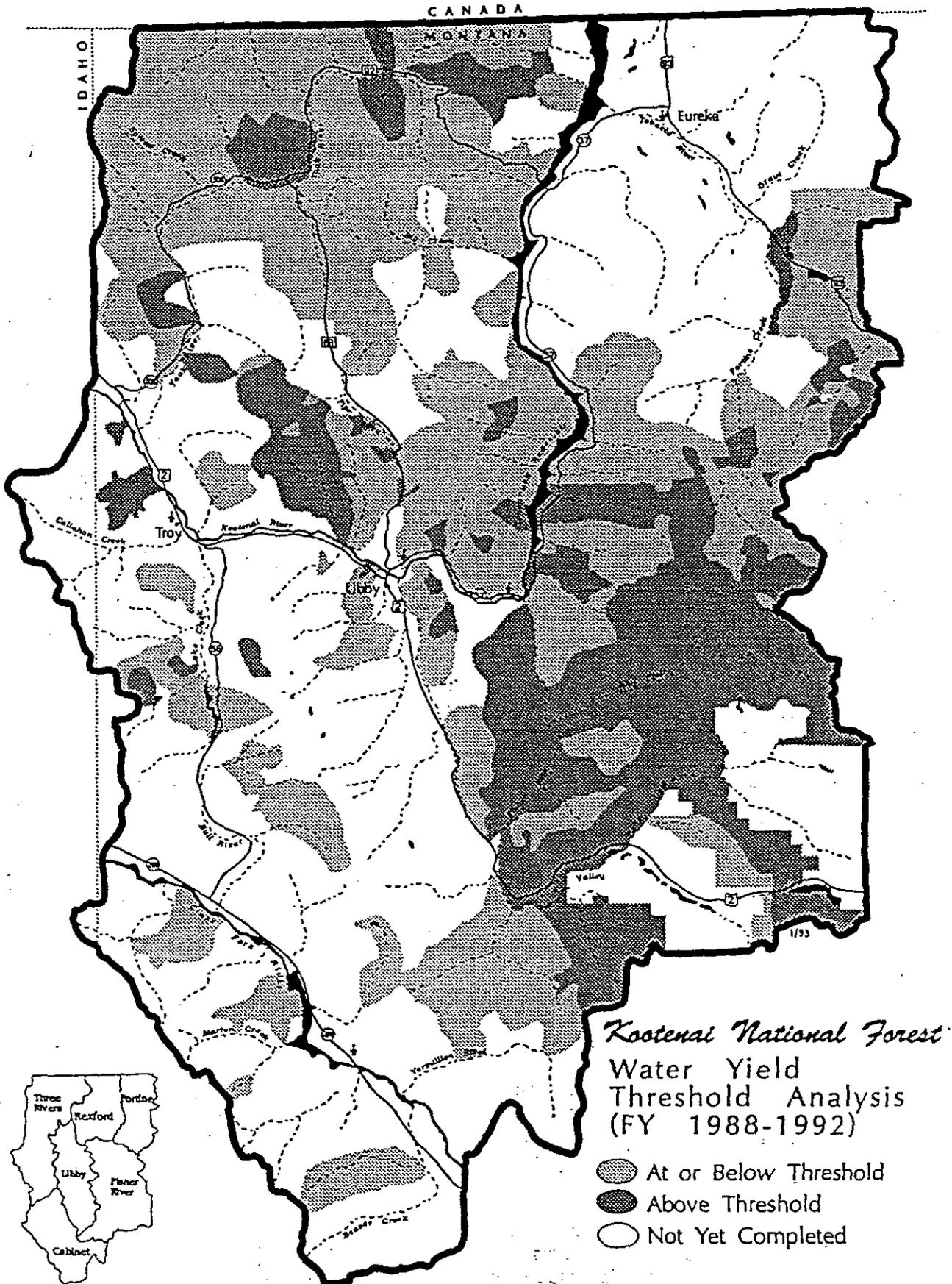


Figure F-3-3a



SOIL AND WATER

Soil Productivity: Monitoring Item F-4

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

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

Background: Soil resource management has the goal of maintaining or improving long-term soil productivity and soil hydrologic function. Soils can be physically damaged by the displacement, compaction, puddling and infiltration reduction due to the use of heavy equipment especially during wet weather and wet soil conditions. They can also be physically and chemically damaged by heat during any intense burning, such as from wildfires, broadcast burning during site preparation, or by the burning of mechanically-bunched slash piles. Soils that are damaged from the above conditions incur adverse affects on their hydrologic function and/or sustain actual losses in soil productivity.

Ideally, the soil quality standards that would be used for measuring soil damage would be soil structure and fertility. Because these soil qualities are difficult to measure, other soil qualities are used to substitute. These substitutes are soil displacement and the associated soil compaction.

Region One has a policy that allows up to 15% detrimental disturbance (FSH 2509.18, 8/92, Draft). The Kootenai Forest uses the 15% detrimental disturbance as a measure to track the impact on site productivity. If 15% of an area is significantly disturbed, then we can say that it has probably incurred a decrease in long-term site productivity.

The threshold determinations are usually done by surveys using line transects through an area that are identified by logging method, equipment used, type of burn, etc. The survey done for this monitoring item investigated 28 timber harvest areas that were scattered across the Forest. These areas represented the current types of logging methods including the current types of equipment being used for mechanical falling, yarding and slash piling. The areas ranged in size from 5 - 77 acres. No burned areas were surveyed.

Results: Table F-4-1 displays the results of the survey completed during the last five years. The results show that the areas surveyed totalled 511 acres. Of this total, 264 acres (52%) were above the 15% threshold.

Areas where cable logging methods were used showed the least amount of detrimental disturbance. Areas where tractors were used for several operations such as yarding and slash piling resulted in a higher level of detrimental disturbance. In general, the amount of heavily disturbed areas increased directly with the number of machinery operations. In contrast, the fewer trips over the ground, the less detrimental disturbance.

Evaluation: The 511 acres surveyed represents about 4% of the annual harvest acres. If the areas measured are representative of the entire Forest, about 52% of logging and site preparation activities may be beyond the recommended threshold stated in the Regional policy. Some of the reasons for the high number of areas beyond the Regional policy of 15% detrimental disturbance are: the application of an approved silvicultural prescription, the inclusion of small areas of steep terrain within areas of more gentle

terrain, inadequate designation of the proper logging equipment, and inexperienced sale administrators and/or logging operators.

Finding: Based on the information stated above, this monitoring item is outside the recommended range stated in the Draft Regional policy (no areas should measure more than 15% of detrimental disturbance).

Table F-4-1 Summary of Disturbed-Soil Survey

Timber Sale Name	Harvest Unit Number	Acres	Percent of Area Detrimentially Disturbed ¹
At or Below 15%:			
Beaver Peak	9	18	12
Blue Rice	21	28	7
Dry Gulch Dixie	14	7	15
Dry Gulch Dixie	14(A)	2	3
Good Creek	1	28	10
Good Creek	16(1)	18	12
Good Creek	16(2)	-	7
Good Creek	16(3)	-	10
Good Creek	16(4)	-	6
Good Creek	24	17	15
Homesteader	4	15	8
Homesteader	27	15	13
Homesteader	27(A)	-	2
Homesteader	30	6	7
South Pinto	2(1)	60	7
South Pinto	2(2)	-	7
South Pinto	4(1)	28	7
South Pinto	4(2)	-	15
Upper Basin	9A	5	6
Total Acres At or Below 15%	-	247	48
Above 15%:			
Blue Rice	17	29	27
Blue Mountain	2	77	20
Dogwood Windy	28	27	22
Dry Gulch Dixie	16	16	20
East Raritan	1	35	25
Good Creek	1(A)	28	19
Good Creek	14	26	20
Homesteader	29	7	25
Upper Basin	9	19	21
Total Acres Above 15%	-	264	52

¹ The Regional Standard is 15% maximum.

MINERALS

Mineral Activity Effects: Monitoring Item G-1

ACTION OR EFFECT TO BE MEASURED:	Determine the amount of management area (MA) change as a result of mineral activity.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Greater than 10,000 acres of MA change after 5 years.

Purpose: This monitoring item was established to track the amount of conflict with other resources that might occur if significant amounts of mineral development happen on the Forest. The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is high.

Background: A major mining project requires a large amount of acreage to physically accommodate the facility (usually 1,000+ acres for roads, powerlines, mining and milling facilities, tailings-holding ponds, etc.). One project in a Forest would not have a significant effect on the renewable surface resources. But if a Forest is strategically located in a mineral-rich area, the potential for a significant impact on the renewable resources could occur over time because of the cumulative effect of numerous proposed projects.

The Kootenai Forest is located within a world-class mineralized area that could prove to be of significant economic importance. Currently there is one major mine on the Forest: Asarco's Mount Vernon Mine. Over the last five years, the Forest has been participating in the planning for two additional mines: Noranda's Montanore Mine and Asarco's Rock Creek Mine.

Results: During the first five years of the Forest Plan period (FY 1988-92), there have been no major projects approved. Noranda's Montanore Mine proposal is currently being evaluated, and if approved, could require 1,370 acres of MA changes to accommodate the project.

Evaluation: After five years, the total MA changes needed are less than the projections outlined in the Plan.

Finding: This monitoring item is within the range prescribed in the Plan.

HUMAN AND COMMUNITY DEVELOPMENT

Changes in Local Economy: Monitoring Item H-1

ACTION OR EFFECT TO BE MEASURED:	Determine the changes in the local economy as a result of Forest Plan implementation.
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Further action will depend on the significance of Forest activities and will most likely be reflected after 10-15 years.

Purpose: This monitoring item provides for the collection and display of information regarding the effect of Plan decisions on local economies. The Plan requires that this item be reported once every five years. The expected accuracy and reliability of the information is low to moderate.

Background: The Forest Plan EIS projected increases in economic growth as a result of Forest Plan implementation. The flow of goods and services from the Kootenai Forest have significant impacts on the economies of Lincoln and Sanders Counties, Montana. Historically, natural resources have been the foundation of these local economies, contributing through the forest products industry, mining, agriculture, tourism, and recreation such as fishing and big-game hunting. Studies conducted during the preparation of the Plan showed that the forest products industry is the largest contributor, creating directly and indirectly about 70% of the two Counties' employment. Inputs to this economic sector are from both private and federal lands, and is variable from year to year depending on timber harvesting plans. In 1988, for instance, the Kootenai Forest accounted for about two-thirds of the timber harvest activity in Lincoln County.

Any variations experienced in the local economies from year to year result from a variety of sources. These include national economic effects, actions of private timber and mining companies, and the flow of goods and services from the Kootenai Forest. Because of these variables, only averages of economic values through longer periods of time provide a true insight into the nature of changes in local economies. To provide the best analysis of the impact of the Plan's decisions on these economies, values covering a 5 to 10-year period are needed. At this 5-year point in the Forest Plan, the variable economic effects have averaged out the extremes and allow some limited comparisons to the historical record. We'll have a more accurate economic estimate at the end of the 10-year Plan period (1997).

Results: Information on economic conditions was obtained from the Bureau of Business and Economic Research (BBER), University of Montana, and from the Kootenai Forest's Annual Timber Sale Program Information Reporting System (TSPIRS).

Total population for both Lincoln and Sanders Counties remained stable in the decade from 1980-1990, which was similar to the Statewide situation. Per capita income rose slightly during the same period, but was less than the Statewide average increase. Both Counties are similar economically, but Sanders County has more employment in agriculture-related jobs, and Lincoln County has more employment in mining and manufacturing jobs. Wood products is the largest component in the manufacturing sector in both counties. As a result, timber harvest volumes from both private and National Forest timberlands is the primary basis for the Counties' economic conditions and thus is the basis for analysis of economic impacts.

For the 10-year period of 1974-1983 (which was prior to the Forest Plan), timber harvest volumes on the Kootenai Forest averaged 173 MMBF per year including both live green and dead salvage volumes. This compares to an average timber sell level of 198 MMBF per year which was 14% higher than the harvest level. From FY 1988-1992 (the first 5 years of the Plan), the harvest volume averaged 207 MMBF per year, a 20% increase over the 1974-1983 period. Timber sell volume for the same 5-year period was 160 mmbf/yr, 23% below the harvest level. This difference between the harvest and sell resulted from harvesting the available timber volume under contract which was purchased prior to 1988. Volume under contract has steadily declined from 590 MMBF at the end of FY 1987 to 256 MMBF at the end of FY 1992, a 57% decrease. In

the most recent two fiscal years (1991-1992), timber harvest volumes have averaged 174 mmbf, which is near the historical levels for the ten-year period of 1974-1983.

The economic impact which resulted from these harvest levels is shown in Table H-1-1. The total jobs produced includes those employed in the timber industry and those in timber-related Kootenai Forest jobs. Total income shown is from private sector operations in timber harvesting, lumber manufacturing and related services along with Kootenai Forest salaries, capital investments, and payments to the Counties and State through the 25% return-receipts fund.

The data for jobs shows a decline from 1989-91, then weak improvement starting in 1992. The lowest part of the decline (1991) coincided with the low harvest level resulting from the national recession. According to the BBER, the small recovery in jobs in 1992 is not due to greater harvest levels, but to increasing harvest of smaller diameter logs. This led to an increase in the number of workers needed to maintain normal production rates. This trend has been reflected in other areas in Montana during 1992.

As with the jobs produced, total income declined from 1987 to 1991. The recent recovery in total income between the lowest part of the decline (1991) and 1992 were mainly due to the increase in the number of jobs required to process smaller diameter logs. In addition, there were also increased payments to the Counties through the 25% return-receipts fund. This increase resulted from higher timber stumpage rates as supply of timber was increasingly constrained both locally and nationally. In the two-county area, decreasing timber volume sold and decreasing volume under contract resulted in keener competition for timber and increases in timber stumpage prices (see the 1992 TSPIRS report for details).

Evaluation: As a result of the national recession and decline in timber harvest volumes, the number of jobs and community income resulting from timber harvest declined about 16% by 1991. In 1992, a weak recovery in both jobs and income began. A significant portion of the raw material entering the market place during the first 5 years of the Plan from the Kootenai Forest was from volume already under contract. Since this source of supply has now been depleted by over 50%, and timber volume being sold has declined by 30% (see Monitoring Item E-1), it's improbable that timber harvest economic impacts can reach the 1988-1989 levels during the remaining 5-year life of the Plan (see Table H-1-1). In addition, harvest levels from private land in the local two-county market area cannot increase to help offset this decline, based on studies from the BBER (see also Monitoring Item F-3). If these trends continue, it's expected that little or no growth will occur in Lincoln or Sanders Counties as a result of the forest products industry. This is in contrast to the Forest Plan EIS, which projected continued growth in this sector.

Finding: This monitoring item will be further evaluated at the end of the Forest Plan period (1997).

Table H-1-1 Changes In the Local Economy by Fiscal Year (FY)⁴

Economic Parameters	FY 1987	FY 1988 ⁵	FY 1989	FY 1990	FY 1991	FY 1992
Number of Jobs ¹	N/A	N/A	3,450	3,350	2,820	2,960
Community Income ² (million of dollars)	N/A	N/A	112.7	113.4	99.0	107.5
Timber Harvested (MMBF) ³	248	248	224	212	174	174
Timber Volume Sold (MMBF) ³	240	179	187	150	100	204

¹ In the timber industry including Kootenai Forest employment. ² Generated from the number of jobs in the timber industry and Kootenai Forest employment, the 25% return receipts payments, and Kootenai Forest capital investments. ³ From the Kootenai Forest only.

⁴ The information used in this Table is taken from the 1992 TSPIRS Report and restated to use more accurate data available from recent studies by the Bureau of Business and Economic Research. The difference from other harvest volumes in this report are due to reporting procedures.

⁵ FY 1988 is the start of the Forest Plan.

HUMAN AND COMMUNITY DEVELOPMENT

Emerging Issues: Monitoring Item H-2

ACTION OR EFFECT TO BE MEASURED:	Emerging issues
VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:	Issues surfaced that were not included in or analyzed for effect by the Plan.

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

Background: Newly emerging issues could affect the Forest's ability to implement the Plan as intended, so they're identified as part of monitoring. An analysis will be made to determine how these potential issues affect programmed output levels. In addition to monitoring emerging issues, the Forest also monitors 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 FY 1992, 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:

Ecosystem Management - Management of the Kootenai Forest for the health and sustainability of the inherent biological systems of both plants and animals is now a national direction.

Biodiversity: is a part of this overall management policy, and locally the concern appears to be surfacing in items such as riparian and wetland management, uneven-aged management, habitat fragmentation, and biological corridors. Management for these values will probably play a part in possible changes to the Plan (amendments, etc.).

Sensitive Plants and Animals: There is increasing concern for sensitive species management to ensure that such plants, wildlife and 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 and recreation.

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 over shortages of snag habitat are developing in many locations on the Forest. This is the result of previous timber harvest practices and firewood gathering. Timber sale policy in the future will address this shortage.

Adjacent Private Land Activities and Their Impact on Kootenai Forest Programs - In watersheds which contain mixed ownership of Kootenai Forest 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 10-year Plan period for certain drainages, and this has had an impact on the Forest's annual timber sell volume.

Air Quality Management - Air quality continues to be a national concern, and locally it focuses on the 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.

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 on Forest programs is still an unanswered question.

Threatened & Endangered (T & E) Species - The Forest has an obligation to provide for the recovery of all T & E species.

Wolf Recovery: 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 also occurring outside the designated recovery area. What effect this recolonization could have on other resource uses is unknown at this time.

Other Possible T & E Species: Some additional species are currently under consideration by the U.S. Fish & Wildlife Service for possible listing as T & E species. Some of these are: the interior redband trout, bull trout and white sturgeon. As an example: a bull trout 'listing' under the Endangered Species Act could affect several activities on the Forest such as road construction, timber harvesting, and riparian area grazing. These activities could be affected because of their potential to produce sediment into streams.

Elk Vulnerability - This is related to a concern that inadequate elk security is being provided in several areas on the Forest because of the lack of large (250 acres+), well-forested areas that are at least a half-mile from a road. These are the areas where elk move to during hunting season to escape from hunting pressure.

Changes Needed After the Lodgepole Pine Has Been Harvested - Questions are being raised about the type of management that will be needed to switch back to a mixed conifer management scheme after the bulk of the insect-infested lodgepole pine has been salvaged. What will be the effects, if any, on the local mills that have geared-up to handle the tremendous volumes of lodgepole pine that have been harvested during the last 10 years?

Continuing Forest Issues that May Still Affect the Forest Plan:

The Forest Plan initially identified and addressed 13 public issues. Of these original 13 issues, the following are still resisting resolution:

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.

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 which is used to calculate compliance with the Forest Plan water quality standards. In addition, a recent watershed condition assessment on the Forest indicates that about 41% of the combined public and private land has limitations to further developmental activity in the near future (such as timber harvest and road construction).

Timber Supply (Local Economic Impact) - 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. Since 1989, timber harvest and total volume under contract have declined 30% and 57%, respectively. The amount of timber sold during this same period has also been 30% less than estimated in the

Forest Plan. Harvest opportunities on private lands can no longer offset this decline. As a result, local community jobs and income have decreased.

Road Management and Public Access - Strong concerns are being expressed about the reduction of public road access to various areas for firewood gathering, huckleberry picking, hunting, including the rights of handicapped and senior citizens to reasonably use the Forest. Some of these concerns infer that road access restrictions are more than intended in the Forest Plan.

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 restrictions for grizzly bear recovery.

Visual (Scenic) Quality - As the Forest and private timberland owners continue the effort to reduce losses from the mountain pine beetle in lodgepole pine and ponderosa pine stands, the overall scenic quality of the natural landscape is changing. This is because the additional harvest areas are now more readily seen throughout the Forest. What net effect this might have on the next Forest Plan effort is unknown, but a revised Forest Plan would likely suggest some rehabilitation in areas where landscape modifications do not appear to meet current Visual Quality Objectives (VQO's).

HUMAN AND COMMUNITY DEVELOPMENT

Forest Plan Costs: Monitoring Item H-3

ACTION OR EFFECT TO BE MEASURED: Determine if the costs of producing outputs that were used in the Plan continue to be valid.

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.

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

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 FY 1992 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 FY 1992 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 1988-1992 unit cost data for these items.

Results and Evaluation:

Timber Sales unit costs for FY 1992 are displayed in Table H-3-1 and show an increase over the level projected in the Forest Plan. This is continuing the upward trend that began in FY 1990. The overall trend during the last five years is up and the average increase is 41% over the projected unit costs which is outside the +/-10% range prescribed in the 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's 91 and 92 costs were also skewed by the significant volume (about 60 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 this year during the 5-year review.

Timber Roads unit costs were close to the level projected in the Forest Plan in FY 1992 (see Table H-3-1). These costs were lower than projected during the first three of the last five years, but that trend appears to have reversed in FY 1991. Overall, the 5-year average of -10% is within the level specified in the Plan (+/-

10%). Review 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's 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 1991, the lower amount of timber sold than in FY 1990 makes the unit cost increase more dramatic than would be expected. In addition to the above factors resulting in lower costs, significant effort has been made to minimize the construction of new roads which also reduces total engineering costs.

Reforestation unit costs were also higher than projected in the Forest Plan in FY 1992 (see Table H-3-1). This continues an upward trend that began in FY 1990. Although there has been a wide variation in these costs (both above and below the projected level), the 5-year average of +11% above the projected unit costs is close to the range specified in the Plan (+/- 10%).

Pre-commercial thinning unit costs also continue to decline (see Table H-3-1). Within the pre-commercial thinning program, these changes in cost are beneficial and significant. However, in terms of the total PNV of the Plan, pre-commercial thinning accounts for only 0.2% of the total contribution to PNV costs.

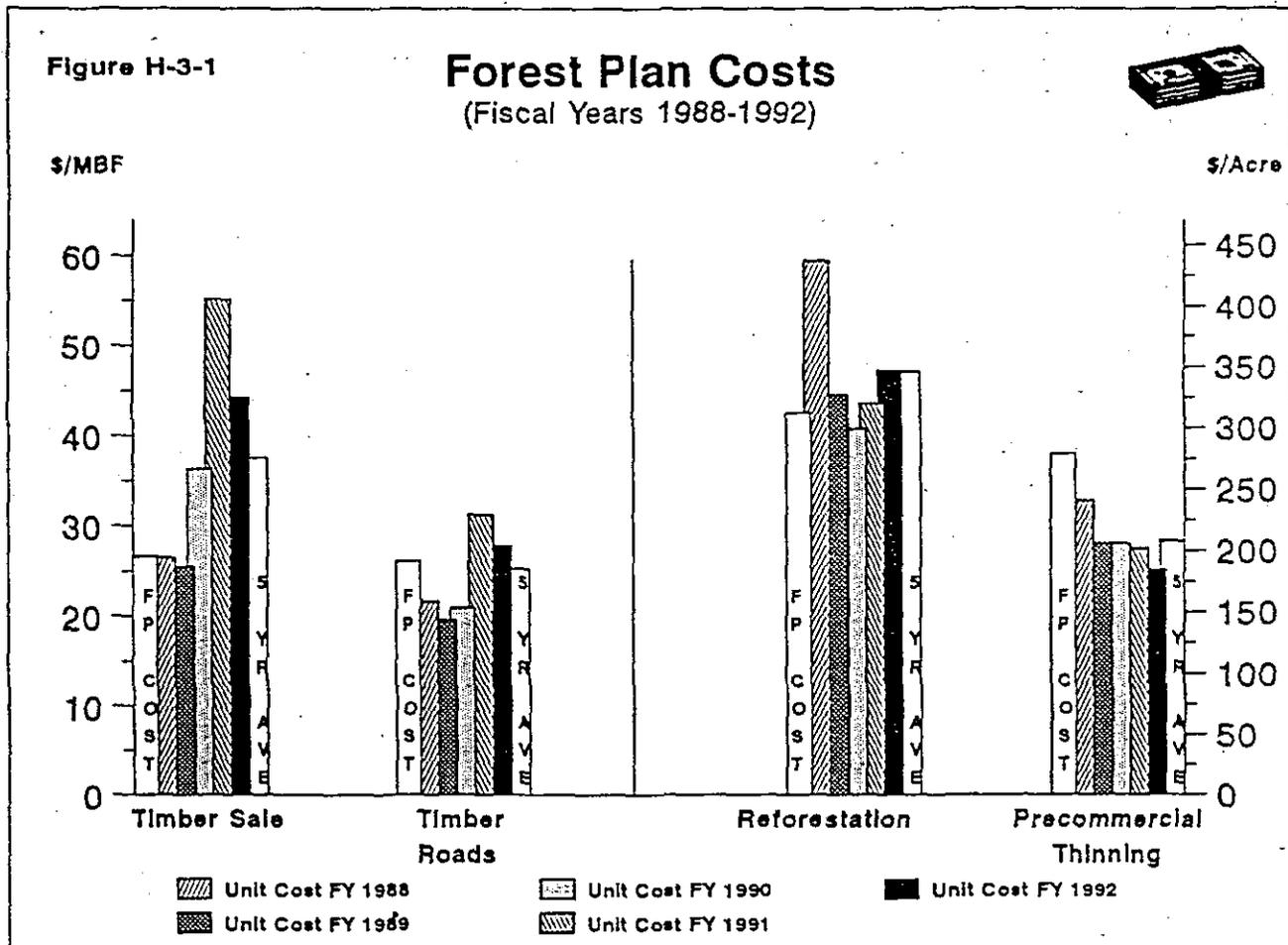
Summary: The total average 5-year weighted timber sale cost is now \$62.73/MBF (which includes timber sales costs of \$37.49 per MBF and timber roads costs of \$25.34 per MBF). This is \$8.07 per MBF or 15% higher than the \$54.66/MBF total combined cost projected in the Plan (see Table H-3-1).

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

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	FY 92	5-Year Weighted Average	% Change From Projected
Timber Sales	\$/MBF	26.58	26.48	25.44	36.25	55.19	44.24	37.49	+41
Timber Roads	\$/MBF	28.08	21.65	19.55	20.90	31.24	27.81	25.24	-10
Reforestation	\$/Acre	312	437	327	299	320	347	346	+11
Precommer. Thinning	\$/Acre	279	241	206	206	202	184	208	-25

* All unit costs in this table have been updated to FY 92 dollars to account for inflation and to provide comparability.



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.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION:

10% deviation by funding item from the predicted levels in the Plan.

Purpose: This monitoring item was established to track the budget levels achieved. The Plan requires that this item be reported annually. The expected accuracy and reliability of the information is high.

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 five 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 percentage difference between the planned budget and actual expenditures for FY's 1988-92. When averaged over all five years, only the Tree Improvement (Item 23), Co-operative Trust Fund (Item 29) and Brush Disposal (Item 31) stayed within the 10% variation level. Other budget items varied from 4 to 375 percent of planned levels (Item 34 and 30). For more detailed information on the specific dollar amounts for each budget item by fiscal year, see Appendix D at the end of this report.

Evaluation: In order to evaluate this information with its wide variations, the major Forest programs were grouped for more easier comparison. For each major Forest program (such as timber, wildlife, recreation, etc.), all applicable budget items were grouped and added together. Data for FY's 1988-92 are 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 1988-92. For each major program area, all applicable outputs were added together. To some extent, some mis-representation was introduced by this addition (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. Following that table, there is a brief listing of each program area, the outputs contributing to it, and an evaluation of the trend.

Table H-4-1 Comparison of Actual Budgets Used to Implement the Forest Plan
(in Percent*)

Fund- ing Item	Budget Activity	Actual Budget as a Percent of the Planned Budget by Fiscal Year (FY)					5-Year Aver- age
		FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	
00	General Administr. (approp.)	84	77	62	79	71	75
01	Fire	78	74	74	79	77	76
02	Fuels	47	25	27	43	58	39
03-05	Timber	75	66	65	72	69	69
06-07	Range	68	57	54	43	90	63
08	Minerals	59	51	55	60	58	57
09	Recreation	66	53	57	75	91	68
10	Wildlife and Fish	36	49	54	70	78	58
11	Soil, Air, Water	56	53	91	94	92	77
12	Facility Maintenance	72	64	62	114	100	82
13-15	Lands/Land Management	41	38	50	82	83	59
42-43	Lands-Status/Acquisition	20	18	11	3	517	114
16	Landline Location	69	75	65	85	93	77
17	Road Maintenance	78	72	74	90	70	77
18	Trail Maintenance	76	42	81	101	91	78
19	Co-op Law Enforcement	227	167	154	113	340	200
20	Reforestation-Appropriated	58	67	60	95	66	69
21	TSI-Appropriated	62	77	52	43	65	60
23	Tree Improvement	94	135	122	102	78	106
28-28	KV (Trust Fund)	98	109	150	155	148	132
29	CWFS-Other (Trust Fund)	102	128	100	113	102	109
30	Timbr.Salv.Sales (Perm.Fund)	119	205	266	511	777	375
31	Brush Disposal (Perm. Fund)	93	101	105	110	102	102
32	Range Improvement	81	48	73	61	75	68
33	Recreation Construction	77	82	14	105	91	79
34	Facility Construction-FA&O	10	0	3	0	5	4
35	Engineering Constr.Support	70	56	57	57	52	59
36	Constr.-Capital Invest. Roads	4	11	36	12	16	16
37	Trail Construction/Reconstr.	49	57	53	124	152	87
24,38	Timber Rd.Constr.-PC/Elect. ¹	63	46	35	44	70	52
	TOTALS	66	64	67	78	84	72

* Each budget year is adjusted for inflation. ¹ PC = Purchaser Credit established.

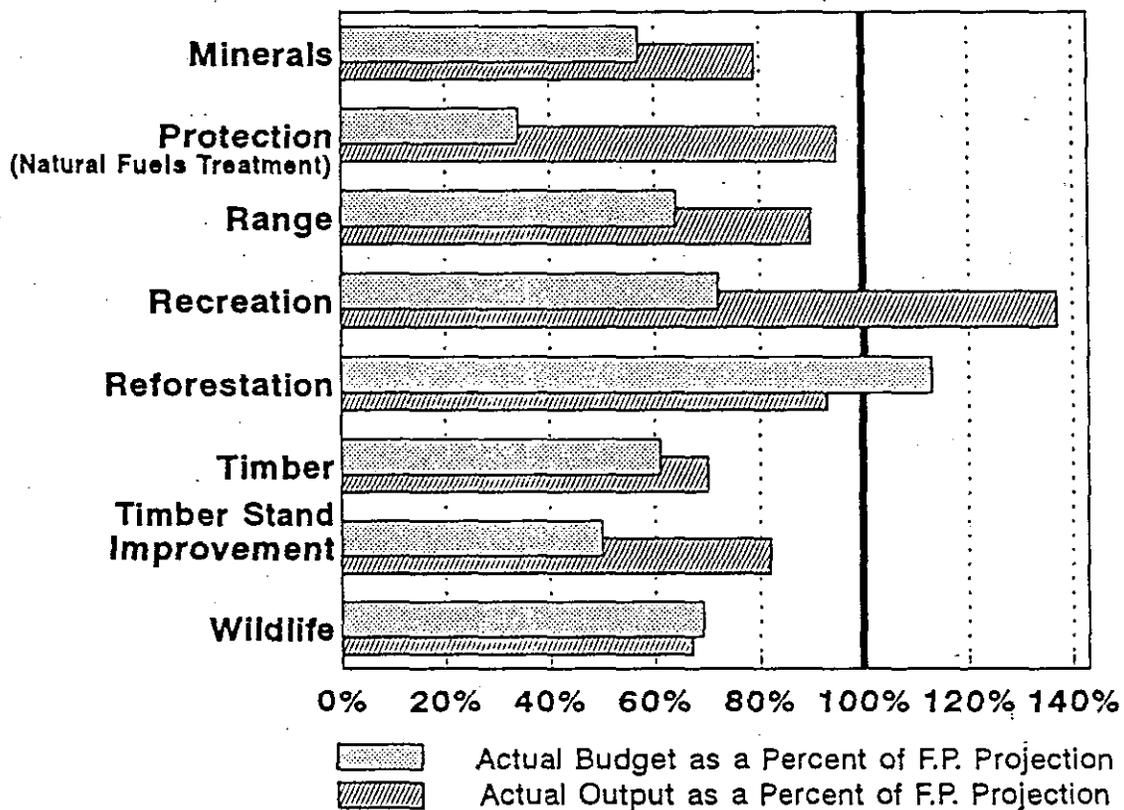
For more detail, please refer to Appendix D at the end of this report for the specific dollar amounts for each budget item by fiscal year.

Table H-4-2 Forest Plan Budget & Output Levels for Fiscal Years 1988-92

Activity or Outputs	Actual Budget as a Percent of Forest Plan	Actual Output as a Percent of Forest Plan Projection ¹
Minerals	57	79
Protection, Natural Fuels Treatment	34	95
Range	64	90
Recreation	72	137
Reforestation	113	93
Timber	61	70
Timber Stand Improvement	50	82
Wildlife	69	67

¹ Factors contributing to the outputs are shown in the text.

Figure H-4-2 Forest Plan Budget and Output Levels
(Compared to Forest Plan Projections) Fiscal Year 88-92



Minerals (number of cases handled): 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 treatment, in acres): Budgets have been quite low in this area, but outputs are close to Forest Plan projections. A firm trend is in place and the actual requirements for this work may be different than those projected in the Plan. An evaluation will be made this year at the 5-year review.

Range (permitted grazing use, in acres): Both range budgets and production amounts are below that shown in the Plan, but relatively less so for production. An evaluation will be made this year at the 5-year review.

Recreation (Total of developed and dispersed use, in recreation visitor days): Compared to the Plan, recreation budgets are lower and outputs are 37% 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. Currently, the assistance of volunteers and challenge grants helps reduce this gap between planned and realized funding. Recreation experience quality could diminish if the current co-operation diminishes and the budget gap continues. The low reliability and accuracy of the dispersed recreation use may also be a contributing factor to the large overrun of outputs.

Reforestation (Acres reforested naturally and artificially, by Forest and cooperators): Reforestation budget and achievement levels are close to those projected in the Plan. It appears that the actual cost of reforestation is slightly higher than that projected.

Timber (Total volume sold, MMBF): Both timber budgets and outputs are less than planned, but indicate a strong direct relationship. See Monitoring Item H-2 for a discussion of timber unit costs and Monitoring Item E-1 for timber sell volume information.

Timber Stand Improvement (Acres precommercially thinned): Actual costs for pre-commercial thinning for the first five 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 (Total acres of wildlife, fish, and T & E habitat improvement): Cumulative budgets and output levels are continuing to be low, but as can be 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 92, it received 78%. 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.

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

FACILITIES

Road Access Management: Monitoring Item L-1

ACTION OR EFFECT TO BE MEASURED: Determine if the road access management objectives of the Plan are being met.

VARIABILITY WHICH WOULD INITIATE FURTHER EVALUATION: +/- 20% of the proportion of open to closed roads, as described in the plan, by the end of the first decade.

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

Background: Just prior to the time the Plan was approved in 1987, about 27% of the Forest system roads were being restricted, either yearlong or seasonally (Forest Plan FEIS, page IV-51). The Plan projected that in order to provide the issue resolution desired, about 57% of the roads would eventually need some form of restriction. This would be about double (+111%) the amount of road restrictions at the time the Plan was approved. The assumption was that the number of new roads needed for timber harvest would increase significantly, and that they would all be restricted after the timber sales were completed -- the net result being a lot more road restrictions but about the same level of original access for the public. The need for the additional road restrictions was to protect dispersed recreation values, provide for wildlife security in big-game winter and summer range, reduce road maintenance costs, and provide for grizzly bear recovery. Because of the significant increase in the amount of road restrictions needed (from 27% to 57%), it was assumed that it would take about 10 years to accomplish. This is about an 11% increase each year to reach the planned level.

Results: Table L-1-1 displays the amount and percentage of road access restrictions (both yearlong and seasonal combined) during the last five years compared to the year just prior to the Plan's approval. The amount of road access restrictions has more than doubled from 1,669 miles just prior to the Plan's approval to 3,784 miles in FY 92. The percentage of total roads that are restricted has increased from 27% just prior to the Plan, to 53% in FY 1992. Also displayed is the amount of roads that are unrestricted compared to the year just prior to the Forest Plan. The amount of unrestricted roads has decreased from 4,530 miles, just prior to the Plan, to 3,365 miles in FY 92.

Evaluation: At the end of five years the Forest is on-track (although ahead of an even-flow annual schedule) in the percentage of road access restrictions needed by the end of the 10-year Plan period (see Figure L-1-1). In contrast, the amount of unrestricted access available to the public is now less than when the Plan was approved. As can be seen in Table L-1-1, in FY 92, there are 1,165 fewer miles of unrestricted access compared to just prior to the Plan's approval. This is a 26% reduction in the amount of general public access existing at the beginning of the Forest Plan compared to the Plan's projection of no significant decrease. These results indicate that an incorrect assumption was made about the amount of unrestricted public access that would remain throughout the life of the Plan.

Finding: Based on the information presented above, this monitoring item is on-track with the Plan's projections.

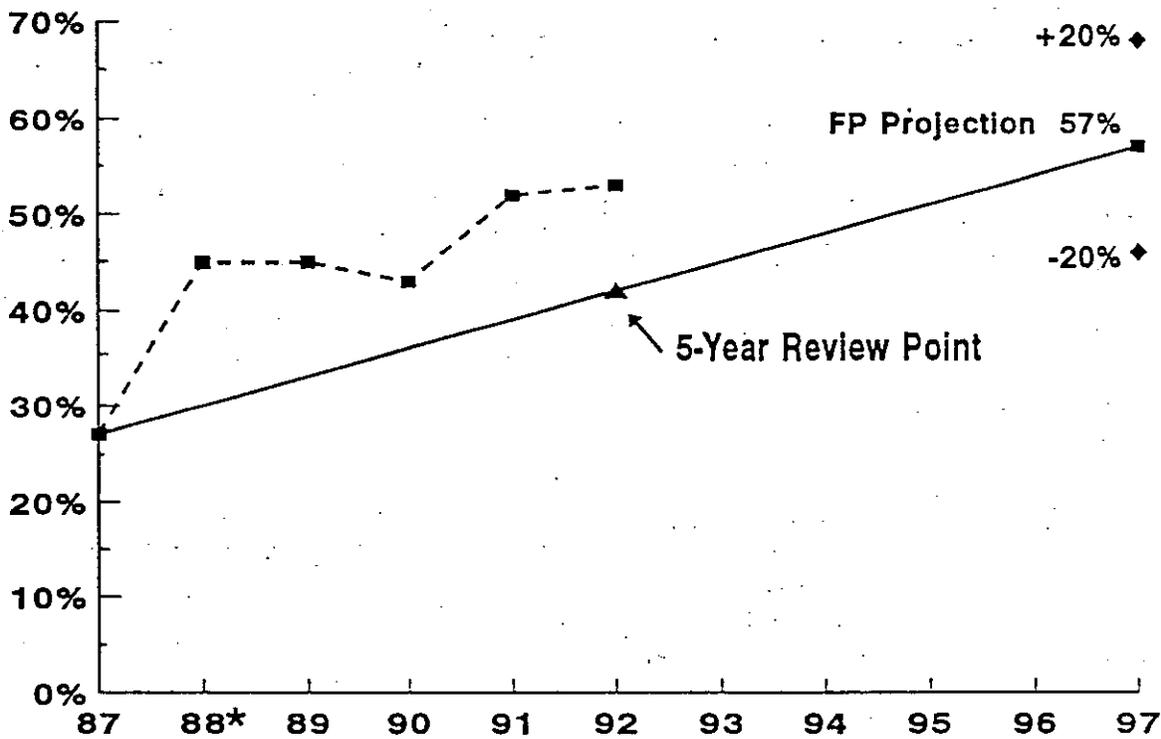
Table L-1-1 Forest Road Access Restrictions¹

Fiscal Year	Total Miles of Road	Total Miles of Restricted Access ²	Percent of Total Roads Restricted ³	Total Miles of Unrestricted Access	Difference in Miles of Unrestricted Access from Fiscal Year 1987
1987 ⁴	6,200	1,669	27	4,530	0
1988	6,972	3,195	45	3,777	-753
1989	7,112	3,260	45	3,852	-678
1990 ⁵	7,052	3,041	43	4,011	-519
1991	7,131	3,734	52	3,399	-1,131
1992	7,149	3,784	53	3,365	-1,165

¹ Forest system roads only that are restricted to motor vehicles. ² Both yearlong and seasonally.
³ The Forest Plan projection is 57% after 10 years. ⁴ The year before the Plan was approved.
⁵ Corrections were made this year in the Transportation System Inventory.

Figure L-1-1

Forest Roads Restricted (%)
 (Fiscal Years 1987-1992)



* Forest Plan Approved in 1988

FACILITIES

Road Density: Monitoring Item L-2

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

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

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

Results: Table L-2-1 displays the road densities calculated for the last five years in suitable timberland. They range from 2.6 to 3.5 miles per square mile and the average is 3.2 miles per square mile.

Evaluation: After five years, the measured road densities on-the-ground are 37% less than projected in the FORPLAN estimate. This is the result of compliance with the Forest Goal to reduce the total miles of road needed, and the result of less road construction occurring because of other reasons. Since the Plan was approved, there has been an intense salvage effort underway to harvest mountain pine beetle-infested lodgepole pine stands (see Monitoring Item E-2 and P-1). The emphasis has been on the timely removal of this dead and dying timber from existing roads which has resulted in less road construction than projected in the Plan (see Appendix A). This reduced road construction experienced over the last five years (about 32% of projected) could be contributing to the low road-densities displayed in Table L-2-1. This is consistent with the reduced timber roads unit costs discussed in Monitoring Item H-2.

Finding: Based on the information stated above, the monitoring item is on-track with the Plan's intent to build the least amount of road possible in the suitable timberlands.

Table L-2-1 Road Densities in Suitable Timberland¹

Fiscal Year	Suitable Acres Analyzed	Square Miles Equivalent	Road Miles Talled	Actual Road Miles per Square Mile
1988	134,310	210	716	3.4
1989	230,662	360	950	2.6
1990	77,876	122	419	3.4
1991	167,419	262	910	3.5
1992	275,870	431	1,388	3.2
Totals	886,137	1,385	4,382	ave. 3.2

¹ FORPLAN estimated range is 4.4 to 5.8 miles per square mile (5.1 ave.)

PROTECTION

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

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

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

Background: The mountain pine beetle (*Dendroctonus ponderosa* Hopkins) throughout the Forest was the most significant insect concern during 1988-92. 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 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, 46,000 acres in 1991 and 33,000 in FY 1992) the acreage infested is still significant and especially damaging in six areas located on the Three Rivers and Rexford Ranger Districts (Young, Sutton, Kelsey and Big Creeks, Flatiron Mountain, and the South Fork of the Yaak River).

Evaluation: This insect-infested acreage has been prioritized for timber harvesting during fiscal years 1988-92. The emphasis has been on the harvest of acreage that is infested, or is at high risk of being infested. All harvesting of insect-infested timber must be within the standards and guidelines of the Forest Plan. Since FY 1988, an estimated 60,000 acres of insect-infested timber has been sold for salvage harvest. This total would have been about 19,600 acres higher if the Ninth Circuit Court Injunction had not occurred in the Upper Yaak (see monitoring item E-1). In comparison, the 6-year period prior to the Forest Plan (1981-87) sold about 146,000 acres of timber salvage.

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 could be affected on the Three Rivers, Libby and Rexford Ranger Districts. Approximately 30% of this total affected area was analyzed, prepared and sold in blowdown salvage sales in FY 1992 and the preparation of additional sales for FY 1993 continues. Some Douglas fir bark beetle has been found in most of the blowdown sales identified but the extent of damage to the surrounding live trees will not be evident until the fall of 1993.

Finding: Based on the information stated above, the monitoring item is on-track.

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.)

TARGET ITEM	OUTPUT or ACTIVITY	UNIT of MEASURE	PLANNED UNITS ¹ FISCAL YEARS 1988-92	ACTUAL UNITS ACCOMPLISHED BY FISCAL YEAR (FY)					Average Units Per Year	Percent of Planned Units
				FY 88	FY 89	FY 90	FY 91	FY 92		
RECREATION	Developed Use ¹⁰	M RVD	297	204	162	171	196	225	192	65
	Dispersed Use	M RVD	18	23	24	30	27	24	26	143
	Wilderness ⁹ Non-wilderness	M RVD	559	797	900	866	1088	1252	981	175
WILDLIFE & FISH	Wildlife Habitat Improvement	M Acres	5.6	3.0	5.1	3.1	3.1	4.4	3.7	66
	T & E Habitat Improvement	Acres	150	405	0	0	0	145	110	73
	Fish Habitat Improvement	Acres	120	276	137	62	28	104	121	101
RANGE	Permitted Grazing Use	M AUM	12.6	11.6	10.3	11.7	11.9	11.5	11.4	90
SOIL	Soil Inventory	M Acres	15.7	1.0	1.0	20.0	5.0	22.0	9.8	62
LANDS	Land Exchange	M Acres	1.7	5.8	3.3	0.3	1.0	0.8	2.2	132
MINERALS	Minerals Management	Cases	300	220	312	226	219	203	236	79
PROTECTION	Fuels Treatment, Natural	Acres	800	621	583	798	925	881	762	95
TIMBER	Total Volume Offered (Sold)	MMBF	233 ²	175	185	148	95 ³	201	161	69
	Reforestation - Appropriated	M Acres	3.0	2.3	3.1	2.9	4.2	3.1	3.1	103
	Reforestation - KV ⁷	M Acres	7.1	5.0	6.4	8.5	9.4	6.5	7.2	101
	Reforestation - Other (Co-op.)	M Acres	4.0 ³	4.2	3.2	3.0	1.4	2.2	2.8	70
	Total Reforestation	M Acres	14.1	11.5	12.7	14.4	15.0	11.8	13.1	93
	Timber Stand Impr. - Approp.	M Acres	4.0 ⁴	3.4	4.0	3.0	2.2	3.7	3.3	82
	Timber Stand Impr. - KV	M Acres	1.0 ⁴	0.5	0.7	1.0	0.7	1.1	0.8	80
	Total Timber Stand Improve.	M Acres	5.0	3.9	4.7	4.0	2.9	4.8	4.1	82
	Stand Examination	M Acres	139	171	208	197	141	141	177	124
Fuel Treatment - BD/KV	M Acres	11.7	11.7	14.5	12.0	11.1	9.5	11.8	101	
FACILITIES ⁵	Total Road Construction ⁶	Miles	237	94	107	112	45	28	77	32
	Trail Construction/Reconstr.	Miles	7.5	6.0	6.0	1.0	9.3	11.4	6.7	89

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 first four years.

⁶ Arterial/Collector and Local roads are now combined into one group to coincide with current engineering recordkeeping.

⁷ Reforestation-KV is now separated into two groups (KV & OTHER) to coincide with current silviculture recordkeeping.

⁸ Corrected to reflect sold and awarded volume for consistency with prior years.

⁹ Corrected for FY 1988-89 information.

¹⁰ Corrected information for FY 1988-91.

Appendix C-1 Summary of Roadless Areas and Changes from 1986-1992 (acres)

Line No.	Inventoried Roadless Area (IRA) Name	Roadless Area No.	Total Acres	Recom. Wilderness	Roadless Recreation	Limited or No Development	Available for Development	Total Development 1986-92	Area Left for Development	Remaining Roadless Area	Plus Additions since FY 88	Total Remaining Roadless Area
1	Scotchman Pk*	662	51,900	36,000	7,400	3,800	4,700	0	4,700	51,900	0	51,900
2	Ten Lakes,Contig. ¹	683A	7,100	7,000	0	0	100	0	100	7,100	0	7,100
3	Trout Creek	664	31,400	0	22,400	2,400	6,600	100	6,500	31,300	600	31,900
4	Cabinet Face West	670	10,900	8,000	1,900	900	100	0	100	10,900	0	10,900
5	Cabinet Face East	671	50,400	19,300	25,800	1,400	3,900	0	3,900	50,400	0	50,400
6	Government Mtn.	673	8,600	0	5,600	2,200	800	0	800	8,600	0	8,600
7	McKay Creek	676	13,500	6,500	1,700	1,600	3,700	0	3,700	13,500	0	13,500
8	Chippewa Cr.	682	1,000	400	200	100	300	0	300	1,000	0	1,000
9	Rock Creek	693	400	0	400	0	0	0	0	400	0	400
10	Roderick Mtn.	684	24,800	0	9,700	12,400	2,700	0	2,700	24,800	0	24,800
11	Galena Creek	677	15,500	0	8,800	4,800	1,900	0	1,900	15,500	0	15,500
12	Cateract Cr*	665	17,700	0	11,100	6,500	100	0	100	17,700	0	17,700
13	Buckhorn Ridge*	661	22,000	0	16,500	300	5,200	75	5,125	21,925	0	21,925
14	Northwest Pk*	663	13,300	0	12,400	200	700	0	700	13,300	0	13,300
15	West Fork Elk Cr.	692	4,800	0	0	3,200	1,600	0	1,600	4,800	0	4,800
16	Gold Hill**	668	10,700	0	2,000	4,200	4,500	6,200	-1,700	4,500	0	0 ²
17	Gold Hill West	176	10,200	0	0	2,000	8,200	1,100	7,100	9,100	0	9,100
18	Berray Mtn.	672	8,300	0	0	6,900	1,400	0	1,400	8,300	0	8,300
19	East Fork Elk Cr.	678	5,000	0	0	3,000	2,000	0	2,000	5,000	1,200	6,200
20	Lone Cliff-Smeads	674	6,600	0	0	4,500	2,100	0	2,100	6,600	2,400	9,000
21	McNeeley	675	7,700	0	0	5,400	2,300	2,680	-380	5,020	2,100	7,720
22	Flagstaff Mtn	690	9,500	0	3,600	4,700	1,200	0	1,200	9,500	0	9,500
23	Roberts Mtn.	691	8,000	0	5,600	700	1,700	0	1,700	8,000	0	8,000
24	Grizzly Peak	667	6,000	0	2,800	800	2,400	0	2,400	6,000	0	6,000
25	Zulu	166	6,400	0	0	1,500	4,900	0	4,900	6,400	0	6,400
26	Marston	172	6,000	0	3,800	1,900	300	0	300	6,000	2,900	8,900
27	Willard-Estelle*	173	18,500	0	18,000	0	500	0	500	18,500	0	18,500
28	Cube Iron-Silcox*	784	500	0	500	0	0	0	0	500	0	500
29	Thompson-Seton*	483	19,100	0	17,100	600	1,400	0	1,400	19,100	0	19,100
30	Tuchuck*	482	2,300	0	2,100	100	100	0	100	2,300	0	2,300
31	Maple Peak*	141	1,000	0	1,000	0	0	0	0	1,000	0	1,000
32	LeBeau*	507	800	0	500	0	300	300	0	500	0	500
	Totals ³		399,900	77,200	180,900	76,100	65,700	10,455	55,245	389,445	9,200	394,145
	Percent		100	19	45	19	16	3	14	97	2	99

* Additional acres are also located on the adjacent Forests (Idaho Panhandle, Lolo, Flathead).

** The area remaining in Gold Hill #668 is now less than 5,000 acres (4,500 acres) and no longer qualifies as an inventoried roadless area.

¹ The Ten Lakes Wilderness Study Area (#683), which is adjacent to this IRA and contains 34,200 acres, is not included in this list of IRA's. This is because of specific wilderness study requirements mandated by Congress in PL 95-150.

² The 4,500 acres remaining in this roadless area have now been deleted from the inventory because of inadequate size (less than 5,000 acres).

³ Another 5,400 acres of roadless area has been identified in 11/92 and will be added next year (Saddle Mtn.#168)

NOTE: The differences between this Table and Table 3 in the Forest Plan Record of Decision, pg. 24, are from errors found since the Forest Plan EIS.

APPENDIX C-2

Roadless Area Changes: Monitoring Item A-6

Summary of Specific Roadless Area Changes by Fiscal Year (FY) and Ranger District (RD)

FY	Inventoried Roadless Area (IRA) Name	IRA No.	RD	Acres Affected	Cumulative Acres Affected	Timber Sale Volume (MMBF)	Cumulative Volume (MMBF)	Name of Project Sold ¹	Located in Grizzly Habitat?	EA ² Approved Prior to Forest Plan?	Remarks
86 ³	Gold Hill West	X176	D5	400	400	1.0	1.0	Purcell T.S.	No	Yes	None
87 ³	Buckhorn Ridge	661	D4	75	475	1.0	2.0	RedTop-Cyclone T.S.	Yes	Yes	None
87 ³	Gold Hill	668	D1	5,500	5,975	1.2	3.2	North Parsnip T.S.	No	Yes	None
88	Gold Hill West	X176	D1	700	6,675	2.2	5.4	Lost Soul T.S.	No	Yes	None
88	LeBeau	507	D3	300	6,975	0.8	6.2	Ketowke Mtn.T.S.	No	Yes	None
89	None	None	N/A	0	6,975	0.0	6.2	None	N/A	N/A	None
90	McNeeley	675	D7	2,680	9,655	8.1	14.3	McNeeley T.S.	No	No	None
90	Trout Creek	664	D7	50	9,701	0.6	14.9	Dry Gulch-Dixie T.S.	No	No	None
91	Gold Hill	668	D1	500	10,205	1.1	16.0	Lawrence Mtn. T.S.	No	No	No longer qualifies as an IRA
91	Gold Hill	668	D1	200	10,405	2.1	18.1	South Parsnip T.S.	No	No	Same as above.
91	Trout Creek	664	D7	50	10,455	0.6	18.7	Lost Copter T.S.	No	No	None
92	None	None	N/A	0	10,455	0.0	18.7	None	N/A	N/A	None

¹ T.S. = Timber Sale; ² EA = Environmental Analysis; D1 = Rexford R.D., D3 = Fortine R.D., D4 = Three Rivers R.D., D5 = Libby R.D., D7 = Cabinet R.D.

³ These were entries prior to the approval of the Forest Plan in FY 1988.

APPENDIX D

Projected & Actual Budget Used to Implement the Forest Plan (from Forest Plan Appendix 7, in thousands of dollars)

Fund- ing 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 Adminstr. (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	68
12	Facility Maintenance	145	239	172	72	253	161	64	267	164	62	68
13-15	Lands/Land Management	156	257	105	41	272	104	38	287	144	50	43
42-43	Lands-Status/Acquisition	98	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. ⁵	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.
⁴ FY 90 is 1.838 times FY 1978 to account for inflation.

² FY 88 is 1.65 times FY 1978 to account for inflation.
⁵ PC = Purchaser Credit established.

³ FY 89 is 1.742 times FY 1978 to account for inflation.

APPENDIX D

Appendix D (continued) Projected & Actual Budget Used to Implement the Forest Plan (in thousands of dollars)

Fund- ing Item	Budget Activity	FY 78 ¹ Dollars	Planned FY 91 ² Dollars	Actual FY 91 Dollars	FY 91 % of Planned Dollars	Planned FY 92 ³ Dollars	Actual FY 92 Dollars	FY 92 % of Planned Dollars	Ave. of FY 88-92 % of Planned Dollars
00	General Adminstr. (approp.)	1,465	2,800	2,220	79	2,912	2,065	71	75
01	Fire	530	1,013	796	79	1,054	809	77	76
02	Fuels	59	113	43	38	117	68x	58	39
03-05	Timber	2,648	5,060	3,629	72	5,264	3,641	69	69
06-07	Range	59	113	48	43	117	106	90	63
08	Minerals	287	548	329	60	571	333	58	57
09	Recreation	561	1,072	806	75	1,115	1,019	91	68
10	Wildlife and Fish	648	1,238	873	70	1,288	1,010	78	58
11	Soil, Air, Water	269	514	481	94	535	493	92	77
12	Facility Maintenance	145	277	317	114	288	288	100	82
13-15	Lands/Land Management	156	298	244	82	310	258	83	59
42-43	Lands-Status/Acquisition	96	183	6	3	191	986	517	114
16	Roadline Location	285	545	462	85	567	529	93	77
17	Road Maintenance	764	1,460	1,314	90	1,519	1,062	70	77
18	Trail Maintenance	115	220	223	101	229	208	91	78
19	Co-op Law Enforcement	12	23	26	113	24	81	340	200
20	Reforestation-Appropriated	871	1,664	1,586	95	1,732	1,141	66	69
21	TSI-Appropriated	562	1,074	457	43	1,117	727	65	60
23	Tree Improvement	20	38	39	102	40	31	78	106
26-28	KV (Trust Fund)	1,427	2,727	4,235	155	2,837	4,190	148	132
29	CWFS-Other (Trust Fund)	348	665	750	113	692	703	102	109
30	Tmbr.Salv.Sales (Perm.Fund)	275	526	2,683	511	547	4,248	777	375
31	Brush Disposal (Perm. Fund)	694	1,326	1,462	110	1,380	1,410	102	102
32	Range Improvement	6	11	7	61	12	9	75	68
33	Recreation Construction	99	189	199	105	197	179	91	74
34	Facility Construction-FA&O	111	212	1	0	221	10	5	4
35	Engineering Constr.Support	2,360	4,510	2,588	57	4,692	2,418	52	59
36	Constr.-Capital Invest. Roads	1,801	3,442	410	12	3,580	568	16	16
37	Trail Construction/Reconstr.	32	61	76	124	64	97	152	87
24,38	Timber Rd.Constr.-PC/Elect. ⁷	2,399	4,584	2,039	44	4,769	3,347	70	52
	TOTALS	19,104	36,508	28,349	78	37,979	32,034	84	72

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

² FY 91 is 1.911 times FY 1978 to account for inflation.

³ FY 92 is 1.988 times FY 1978 to account for inflation.

⁷ PC = Purchaser Credit established.

APPENDIX E

KOOTENAI NATIONAL FOREST

WATERSHED CONDITION ASSESSMENT SUMMARY BY RANGER DISTRICT

Total Public and Private Lands Combined

Ranger District	Acres Below Critical Threshold	Per-cent	Acres At Critical Threshold	Per-cent	Acres Beyond Critical Threshold	Per-cent	Total Acres Analyzed	Per-cent
Rexford	200,000	69	75,000	26	13,000	5	288,000	100
Fortine	205,000	60	123,000	36	16,000	5	344,000	100
3 Rivers	416,000	63	131,000	20	110,000	17	657,000	100
Libby	223,000	58	75,000	19	89,000	23	387,000	100
Fisher R.	197,000	33	321,000	53	86,000	14	604,000	100
Cabinet	343,000	81	61,000	14	22,000	5	426,000	100
Totals*	1,584,000	59	786,000	29	336,000	12	2,706,000	100

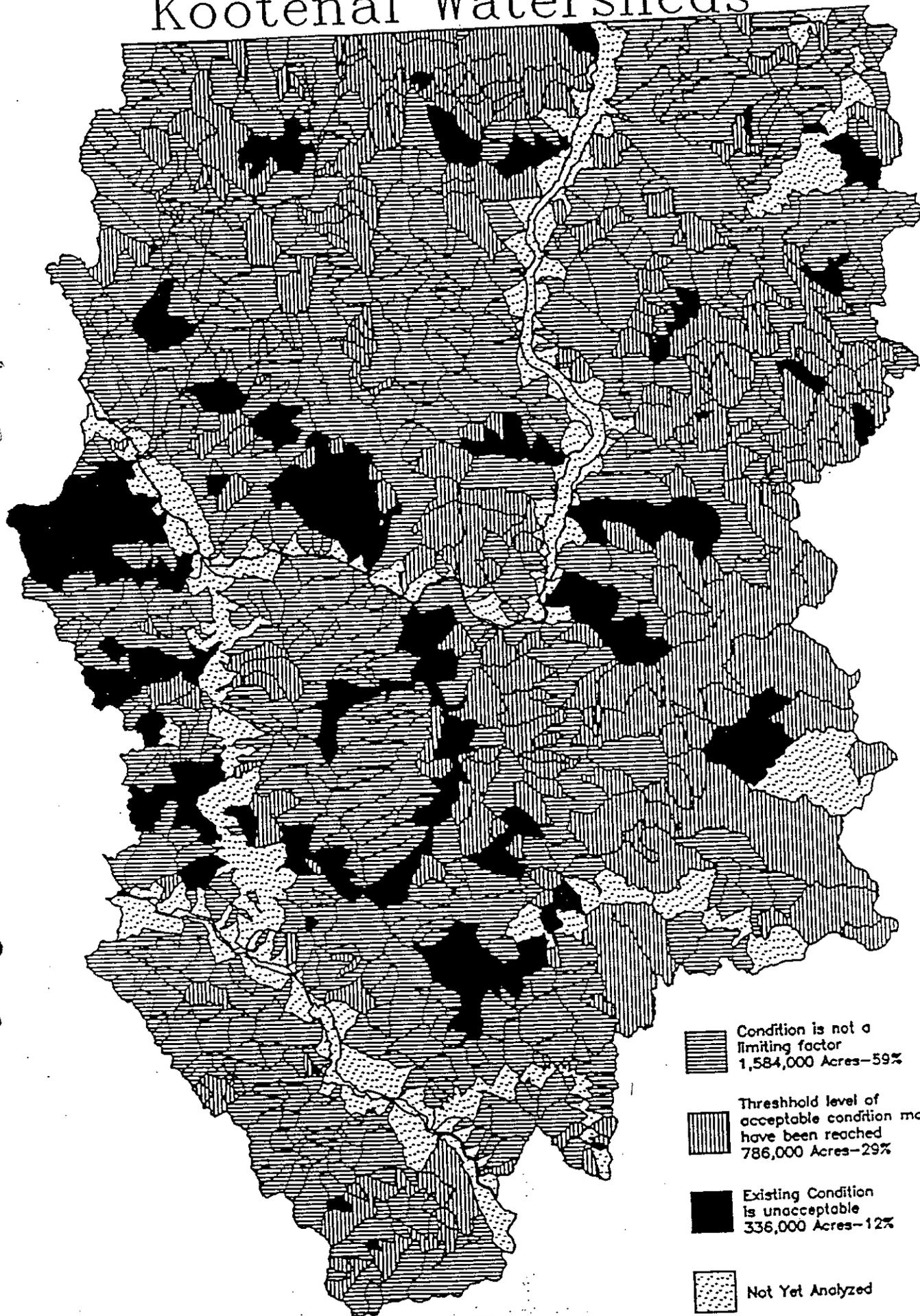
* Totals may not be exact because of rounding.

Total Kootenai Forest Suitable Timberland Only

Ranger District	Acres Below Critical Threshold	Per-cent	Acres At Critical Threshold	Per-cent	Acres Beyond Critical Threshold	Per-cent	Total Acres Analyzed	Per-cent
Rexford	135,000	69	52,000	27	9,000	5	196,000	100
Fortine	84,000	55	64,000	42	5,000	3	153,000	100
3 Rivers	226,000	64	80,000	23	45,000	13	351,000	100
Libby	111,000	62	30,000	17	37,000	21	178,000	100
Fisher R.	109,000	55	62,000	31	28,000	14	199,000	100
Cabinet	115,000	72	37,000	23	8,000	5	160,000	100
Totals*	780,000	63	325,000	26	132,000	11	1,237,000	100

* Totals may not be exact because of rounding.

Kootenai Watersheds



6
miles

APPENDIX F

LITERATURE CITED

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- USFWS. 1986. Pacific bald eagle recovery plan. USDI Fish and Wildlife Service, Portland, OR. 160 pp.
- USFWS. 1987. Northern Rocky Mountain wolf recovery plan. USDI Fish and Wildlife Service, Denver, CO. 119 pp.

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
406-293-8661

**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