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Forest Plan Monitoring Report for Fiscal Year 1990

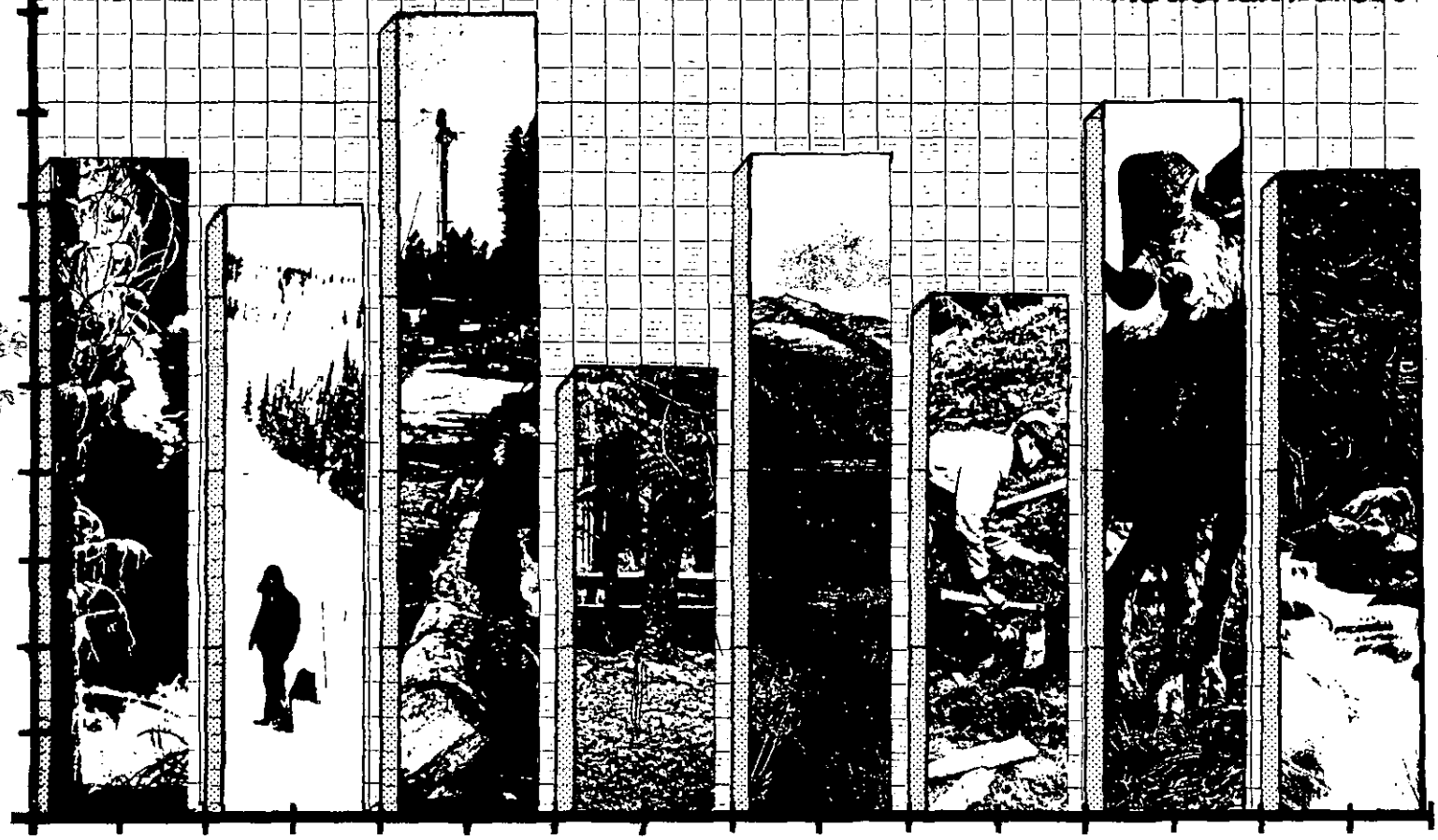
March 1991

Kootenai National Forest Plan

United States Department of Agriculture

Forest Service

Kootenai National Forest



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

Reply to: 1920

Date: March 15,1991

Dear Forest Planning Participant:

Here is the Kootenai National Forest Monitoring and Evaluation Report for fiscal year 1990. It was prepared to show where we are with the implementation of our Forest Plan, which was approved in September, 1987. In addition to displaying our fiscal 1990 information, the report includes data brought forward from our last report, which covered fiscal years 1988 and 1989. We hope that this will help you to see how the management of all major Forest resources has progressed during the first three years of implementation of our Plan.

If you have any questions about this report, please contact the Ranger Station office nearest you (listed in Appendix D) or Paul Leimbach, Forest Planner, at the Forest Supervisor's Office in Libby (406-293-6211).

ROBERT F. SCHRENK
Forest Supervisor

Forest Plan Monitoring Report for Fiscal Year 1990

Kootenai National Forest
March, 1991

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Forest Plan Annual Monitoring Report for Fiscal Year 1990

Kootenai National Forest

INTRODUCTION

We have recently completed the monitoring of Forest Plan implementation for fiscal year 1990. This was the third year of operation under the Plan, and includes the period from October 1, 1989 to September 30, 1990.

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

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

Process: At this point in our Plan period (the end of the third year), our concern is mostly with implementation monitoring. The Plan's guidance for this type of monitoring is found in Chapter IV of the Forest Plan (see Appendix C of this report). It lists specific items that we're tracking during implementation monitoring. It also provides guidance to help determine if implementation is within the stated variability limits. If an item is not within the stated limit, an evaluation is undertaken to find the reason for the deviation. The Forest can then take any needed steps to bring the implementation to within the desired limits.

The information that we gain from this periodic monitoring will be used for our formal 5-year Plan review. This 5-year review will begin after October 1, 1992. As indicated in Chapter IV of the Plan (see Appendix C), there are 39 items to be measured on a yearly basis. Of the 39 items, 13 are to be reported on an annual basis and 4 need to be reported every other year. The remaining 22 items are reported on a 5-year basis. This third-year report will discuss only the 13 annual-reporting items.

Procedure: For each of the 13 monitoring items, we first checked to see if it was within the desired limits of variability. If it was, then we concluded there was adequate compliance with the Plan. In some cases, we found that we could currently be within the desired limits, but the 3-year trend indicates that the allowable variation will be exceeded by the time the 5-year review begins (October 1, 1992). For these items, we are working to achieve the allowable variation during the next two years and to continue to carefully monitor in preparation for the formal 5-year review. Finally, there are monitoring items that we found are not currently within the desired variability limits. For these items, the Forest will continue to work to improve in order to reach the desired limits.

SUMMARY

When we answer the question **"Did we do what the Plan said we should do?"**, we find sufficient information to determine that we can say **YES** for three (3) items because we're within the Plan's stated limits, and **NO** for three (3) items because we're outside the limits. For those remaining monitoring items, one (1) is **ON-TRACK** and three (3) are **OFF-TRACK**. Two (2) others have **INADEQUATE RESULTS** to draw conclusions. One (1) item **DOESN'T FIT** into any of these five categories.

So what does all this mean? It means that on some areas we are in compliance with the Plan, and on others we need some improvement. It means that there are some areas where we will meet the Plan's direction by the 5-year reporting date if current trends continue. It also means there are some items where we will not meet the Plan's intention unless we take corrective action.

The monitoring items where we can say **"YES**, we are in compliance with the Plan" include: **Threatened and Endangered (T & E) Species Habitat, Range Use**, and **Water Yield Increases**. We're in compliance on these items because we're within the Plan's stated limits of variablility. Specifically, here is what we found for these items:

T & E Species Habitat (C-7): Through this item we're monitoring the quantity and quality of habitat for the recovery of peregrine falcons, gray wolves, bald eagles and grizzly bears. We're also observing the animals to obtain population estimates and trends. We haven't observed increases in the number of sightings of peregrine falcons, but we have for bald eagles and gray wolves. Sightings of grizzly bears have increased in the Northern Continental Divide Ecosystem but have remained stable in the Cabinet Yaak Ecosystem. Overall, the amount and quality of habitat for all these species is being maintained or improved and the Forest is within the recovery goals stated in the Plan.

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

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. (The watershed analysis includes both National Forest and private land.) About 53% of all the land within the National Forest drainage boundary has been analyzed, and many of these watersheds included significant amounts of intermingled private land. Of all these examined watersheds, 24% exceed the water yield guidelines. The stated limit in the monitoring plan is 20% of all the watersheds on the Forest. Watershed conditions are expected to be better throughout the remainder of the Forest which is predominantly National Forest land. As the remaining watersheds are analyzed, it should reduce the current forestwide percentage of 24% down to the stated limit of 20%. Whenever the water yield standard is exceeded in an area, planned activities on the National Forest lands have been deferred until watershed recovery occurs. This has been necessary to meet the Forest Plan standard and protect downstream beneficial uses as required by the Montana State water quality goals. In addition, an organization called the Montana Watershed Co-operative has been formed to provide co-operation in timber harvest plans and methods on intermingled ownerships. The members of the organization include the Kootenai, Flathead and Lolo Forests, the State of Montana, Plum Creek Timber Company and Champion International Corporation.

The monitoring items where we answered **"NO**, we're not in compliance with the Plan" are: **Soil and Water Conservation Practices, Forest Plan Costs**, and **Forest Plan Budget Levels**. These items are not in compliance with the Plan because the results are outside of the Plan's stated limits. Specifically, here's what we found for these items:

Soil and Water Conservation Practices (F-1): Monitoring of soil and water quality conservation practices showed that we did not fully meet our objective of 100% compliance with the State water quality guidelines. The use of best management practices (BMP's) is a new practice for the Forest, and we're still learning how to stay within the State standards. Continued familiarity with BMP's and a better understanding of how certain practices affect water quality should bring up the level of implementation success.

Forest Plan Costs (H-3): Here we evaluated whether the costs of producing Forest Plan outputs continue to be valid. Of the items evaluated, timber sale preparation costs have increased significantly and exceed the 10% deviation limit in the Plan. In contrast, road construction costs are below Forest Plan projections.

Forest Plan Budget Levels (H-4): For fiscal years 1988-90, the average Forest budget has been less than stated in the Forest Plan (66% of the planned level). Most of this difference is the result of budget trends that were in-place prior to the approval of the Plan. Since the Plan was initiated, we have been working to achieve budgets more in line with projections. In at least one major area, Fish and Wildlife, there has been considerable progress in achieving this.

Several monitoring items are reported annually but are not formally evaluated until 5-years have elapsed. However, for these items, the data is evaluated as to whether the quantitative limits are being met. If the data indicates that the results are within the Plan's limits, then the item is determined to be **ON-TRACK**. If the data indicates that the limits are being exceeded, then the item is determined to be **OFF-TRACK**. The monitoring item that's **ON-TRACK** for the 5-year evaluation period is **Timber Harvest Deferrals**. The items that are **OFF-TRACK** for the 5-year evaluation period are: **Timber Sell Volume, Acres Sold for Timber Harvest**, and **Suitable Timber Management Area Changes**.

Monitoring items that are **ON-TRACK**:

Timber Harvest Deferrals (E-7): Acres of suitable timber can be deferred from timber sales due to economics, resource conflicts or other unforeseen reasons. During the 3-year monitoring period, several events or situations caused deferrals but not enough to initiate further action (10,000 acres net change in the size of any management area). The events and situations that deferred suitable timber acreage from sale proposals include poor timber sale economics, existing cutting units reaching big game hiding cover more slowly than expected, significant timber harvest on intermingled private land, and the impact of the injunction imposed by the Ninth Circuit Court in the Upper Yaak area. If the current trend of timber harvest acreage deferrals continues, this item may be off track by the end of fiscal year 1991 (September 30, 1991).

Monitoring items that are **OFF-TRACK**:

Timber Sell Volume (E-1): The Forest's allowable sale quantity for the full decade of the plan on suitable lands is 2,270 MMBF. To reach this total in a steady fashion, the Forest's average annual programmed sell volume on suitable lands would be 227 MMBF/year. For the first three years of implementation, the average actual annual sell volume has been 167 MMBF/year, resulting in a deficit which averaged 60 MMBF/yr or 181 MMBF for the full three year period. This deviation has been the result of additional habitat delineation for grizzly bear management in the Cabinet-Yaak Ecosystem, deferrals to meet watershed standards in intermingled lands, and other reasons. It appears likely that the causes of the deficit will remain in place for the near future, and that projected sell levels will not be met under these conditions. For more detailed information regarding this trend, see the next section (Observations of Some Forestwide Trends) and Monitoring Item E-1, Timber Sell Volume.

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

Suitable Timber Management Area Changes (E-3): The Forest Plan allows for changes in the boundaries of management areas based upon site-specific analysis and interdisciplinary review. However, large changes could impact the ability of the Forest to produce particular outputs. One non-significant amendment of the Forest Plan has already been filed (Amendment #2 - February, 1989) to account for such a change. After three years, the total net change in Management Area 15 (Timber Production) is beyond the Plan's limit. The total net change of suitable timberland since October, 1987 has been a loss of one-half of one percent (6,120 acres).

The monitoring items where we have **INADEQUATE RESULTS** include: **Noxious Weed Infestations** (D-2) and **Stream Sedimentation** (F-2). These items were not monitored to a level sufficient to make firm determinations of whether or not they're within the variability limits.

The monitoring item that **DOESN'T FIT** into any of the five categories was **Emerging Issues** (H-2). This item focuses on issues that appear to be developing since the Plan was initiated, and also monitors the Forest Plan issues that appear to be changing. Emerging or potential issues identified include: air quality management, biodiversity, impacts to Forest Service activities from adjacent private lands, non-system road management, nutrient recycling, and sensitive plants and animals. The Forest Plan issues that are changing are: grizzly bear management, potential mineral development, state water quality standards, timber supply, elk security/cover and forage, snag habitat management, road access, wolf recovery, and roadless area partitioning for timber harvest.

OBSERVATIONS OF SOME FORESTWIDE TRENDS

The results of the last three years of monitoring indicates that a trend is emerging. This trend is the cumulative reduction of timber outputs from management areas suitable for timber harvest. We have not fully quantified this trend as yet, but we'll continue to monitor it between now and the formal 5-year review when an intensive analysis will be made. (The formal 5-year review will begin in 18 months in October, 1992.) Below is a summary of the items which appear to be affecting timber outputs and which will be monitored and then fully analyzed at the formal review point:

Results of Formal Forest Plan Monitoring

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

Water Yield Increases: In watersheds containing both National Forest and private industrial forestland, accelerated private land timber harvest has brought many areas near or beyond threshold levels for water yield. This situation has resulted in reductions of harvests on Forest lands to avoid adverse watershed effects. The estimated total land involved is 419,000 acres. About 210,000 acres of National Forest land are affected, which includes about 157,000 acres of suitable timber. During development of the Forest Plan no allowance was made for such reductions in timber harvest on National Forest land in intermingled ownership.

Timber Harvest Deferrals: When timber sales are being planned, a site-specific analysis is done to determine if the Forest Plan standards can be met. When discrepancies are observed, adjustments are made to the project to ensure compliance. These adjustments can result in a deferral of formerly planned harvest acres to some future time beyond the Forest Plan period. In addition to harvest acres deferred beyond the current Plan period to provide for watershed recovery, a number of deferrals have been made for unexpected conditions such as appeals and litigation. Others have been made because of low cost-effectiveness and other factors beyond the Forest's control. To date, over 14,200 acres have been deferred from timber harvest for at least the first decade.

Suitable Timber Management Area Changes: During the site specific timber sale project analysis, mapping and other errors are occasionally found for management area boundaries. Most of these are minor changes are needed to correct conditions inaccurately portrayed on the Forest Plan map, such as non-productive forest land, areas with regeneration problems, and newly found stands of old growth. As a result of this site specific analysis, the total net 3-year decrease of suitable timber acreage exceeds 6,500 acres.

Other Informal Monitoring Results

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

Grizzly Bear Habitat: The Forest Plan provides for 1,035,000 acres of grizzly bear habitat on the Forest within the North Continental Divide Ecosystem and the Cabinet-Yaak Ecosystem. During formal consultation with the U.S. Fish and Wildlife Service for the Upper Yaak EIS and other projects, analysis showed that there is habitat for grizzly bear beyond that specified in the Forest Plan. As a result, 248,000 acres was added to the area affected by grizzly bear standards and guides. Of this, 143,000 acres are in suitable management areas, which had been originally programmed for timber harvest at levels higher than acceptable for grizzly bear recovery. This area is shown on the map at the end of this section. The U.S. Fish and Wildlife Service is expected to issue a revision of the Cabinet-Yaak Ecosystem Recovery Plan within a few months which will detail specific recovery objectives and constraints.

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

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

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

Upper Yaak: On-the-ground experience in the upper Yaak River drainage can serve as an example to illustrate the effect of the above factors on deviations to the Forest Plan. An intensive analysis was made for this area as part of the Upper Yaak River EIS. The results displayed in the Final EIS indicated that there is a difference between Forest Plan projected average outputs and the activities chosen to best implement the Plan's standards in a site-specific fashion. For example, the Yaak FEIS Alternative

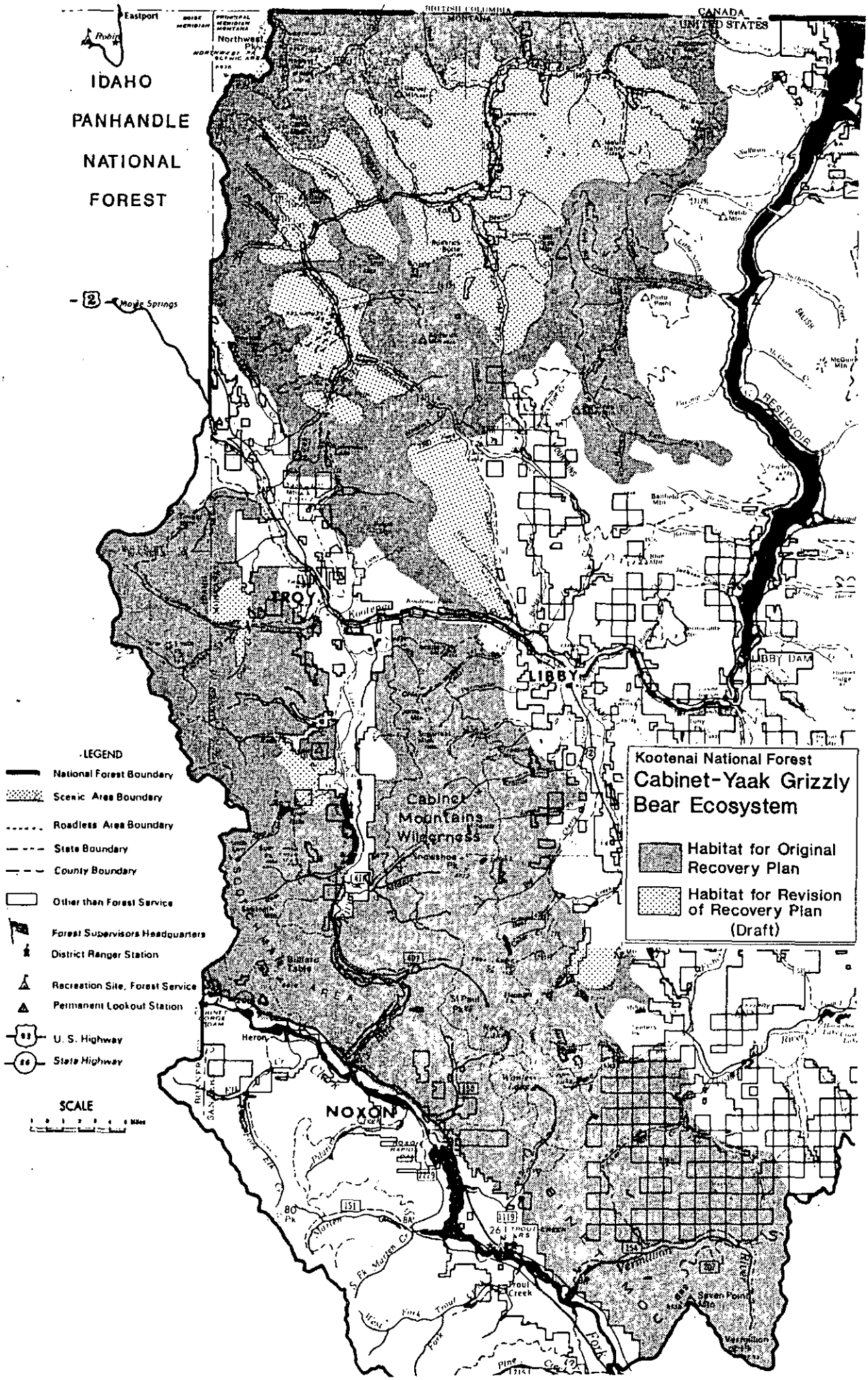
3 harvested 7,845 acres (121 MMBF) and was designed around the Forest Plan average projections. Alternative 9A harvested 5,500 acres (90 MMBF) and was the final selected alternative that best met the Forest Plan standards in a site-specific fashion. This represents a difference of 2,345 acres in the currently available suitable timber land (-30%), and 31 MMBF in currently available timber volume (-26%) than projected in the Forest Plan. (See the Upper Yaak River Final EIS, pg. S-11.) Insofar as the Upper Yaak River analysis is a reflection of appropriate implementation of the Forest Plan, the difference between projected average Forest Plan outputs and actual site-specific determinations confirms the formal and informal monitoring results described above.

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. Over 400,000 acres are involved in timber harvest reductions and deferrals for a variety of reasons, including deferring harvest on intermingled Forest ownership, identification of additional grizzly bear habitat, elk summer range security needs, and others. Since there is overlap between some of these, and effects are not yet well quantified, it is estmated that as much as 300,000 acres have been restricted in some fashion. This amounts to about one-quarter of the total suitable management areas on the Forest (1,263,000 acres). Clearly, this is affecting the ability of the Forest to provide timber sell levels to eventually reach the Plan's allowable sale quantity. This is reflected in formal monitoring results which show 66% of planned regeneration harvest acres (-34%), and a 74% timber sell volume level (-26%) with indications that a continued decline can be expected (see **Acres Sold for Timber Harvest** (E-2) and **Timber Sell Volume** (E-1), respectively). At the 5-year review point, further analysis with additional monitoring information will show more detailed effects in terms of how these factors interact with achievement of the goals and objectives of the Plan. Programmed harvest is only one of the goals of the Plan, and all will be considered interactively at that time.

Summary of the Last Three Years of Forestwide Trends

The similarities between the results described above for the formal and informal Forest Plan monitoring and the results experienced in the Upper Yaak River EIS seem to point in a similar direction. That direction indicates that the effectiveness of the Forest's suitable timber base is being increasingly constrained by a variety of resource factors that are cumulative in nature. The net effect appears to be a reduced ability of the suitable timber management areas to provide the harvest opportunities that were estimated in the Forest Plan projections. The magnitude of this reduced effectiveness may be as much as 30%. Given the size of this difference, the Forest will continue to closely monitor this emerging trend to ensure that we have adequate information available to make an accurate assessment of this situation at the 5-year review.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LIBBY
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Cabinet Mountains Wilderness
NOXON
Heron
Thompson Falls
Kootenai National Forest
Cabinet-Yaak Grizzly Bear Ecosystem
Habitat for Original Recovery Plan
Habitat for Revision of Recovery Plan (Draft)
LEGEND
National Forest Boundary
Scenic Area Boundary
Roadless Area Boundary
State Boundary
County Boundary
Other than Forest Service
Forest Supervisors Headquarters
District Ranger Station
Recreation Site, Forest Service
Permanent Lookout Station
U. S. Highway
State Highway
SCALE

WILDLIFE AND FISHERIES

T & E Species Habitat: Monitoring Item C-7

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

Results and Evaluation:

Peregrine Falcon: There are no specific recovery goals for the Forest, but the goal for Montana is 20 nesting pairs (USFWS, 1984). There were two sightings of peregrine falcons in the Spring of 1990. They were observed in the Tobacco River-Tobacco Valley area in the northeast corner of the Forest. These are the first sightings since the Fall of 1988. Few observations of peregrines have been made historically, and are probably limited to birds migrating between nesting and overwintering territories. This thru-migration is presumed to correlate to the limited amount of quality nesting habitat available on the Forest.

Gray Wolf: Guidance for the recovery of the gray wolf is derived from the Wolf Recovery Plan. The recovery area is located in the northeast corner of the Forest within the Fortine Ranger District. Habitat conditions are considered good and have not changed since monitoring began in 1988. Hiding cover is abundant and well dispersed. Security values are high because of limited road access. Man's activity levels are low to moderate because few resource management projects occur in the area. Available prey is abundant. Because of these desirable habitat conditions, the gray wolf population has every opportunity to increase.

Some of the sightings in FY 1990 were outside of the delineated recovery area. Overall, there were six sightings of wolves in 1990 compared to seven in 1989 and two in 1988. Within the Wigwam Creek drainage on the north end of the recovery area, one pack member was radio-collared, and another wolf pack has moved in and is being monitored by the Wolf Ecology Project. An additional wolf pack, which inhabits the south end of the Fortine Ranger District (outside the recovery area), gave birth to three pups in the spring.

Bald Eagle: Guidance for bald eagle recovery comes from the Montana Bald Eagle Management Plan (1986) and the Pacific States Bald Eagle Recovery Plan (1982). These plans call for establishment of 52 nesting pairs within the Montana section of the upper Columbia River Basin on both public and private land. Most of the Forest's effort centers on coordination to integrate bald eagle needs with other land management activities such as recreation, wildlife habitat improvement, land exchanges, minerals development, and timber harvesting.

Within the Forest, bald eagle populations are observed primarily along major watercourses. In 1990, a total of 86 bald eagles were sighted during the annual mid-winter survey (65 mature and 21 immature). This is down from the 1989 all-time high count of 110 but higher than the 77 counted in 1988. Observers found a total of 12 active nests with a total of 17 fledged young. This is an increase from the six active nests observed in 1989 and the three observed in 1988. The Kootenai River corridor, Koocanusa Reservoir, Fisher River, Wolf Creek, Noxon and Cabinet Gorge Reservoirs, and the Clark Fork River were the primary sighting areas.

Biological evaluations (BE's) are made for all proposed projects within or adjacent to bald eagle habitat. In 1990, 25 BE's were completed and all concluded that no negative effects were present or likely to adversely affect the habitat.

Grizzly Bear: The Forest's primary effort in grizzly bear recovery is in habitat management. Recovery goals are based on the Grizzly Bear Recovery Plan (USFWS, 1982). Table C-7-1 shows habitat effectiveness values for each of the grizzly bear management units (GBMU's) evaluated during fiscal years 1988-90. Effectiveness is based on habitat security, and the desired level is 70% or greater.

In fiscal year 1990, ten GBMU's are above the desired 70% level. This is an increase from nine GBMU's in FY 1989. Of the eight GBMU's that are still below the desired 70% level, all of them are improving or maintaining in habitat effectiveness. As the Forest's habitat management program continues, the GBMU's are expected to continue to improve and eventually reach the desired level of effectiveness.

Un-duplicated sightings of females with cubs are considered to be important indicators of potential population growth. In 1990, there were five confirmed un-duplicated sightings of female grizzly bears with cubs in the Northern Continental Divide Ecosystem (NCDE). This grizzly bear ecosytem is located within the Fortine Ranger District in the northeast corner of the Forest. There were no confirmed sightings of female grizzlies with cubs on the remainder of the Forest which encompasses the Cabinet-Yaak Ecosystem (CYE), but there has been continual monitoring of a radio-collared female and her three 2-year-old offspring on the Three Rivers District.

Mortality rates are another key indicator of potential population trends. In 1990, no known mortalities have occurred in either the NCDE or CYE. This is an improvement over both 1989 and 1988 which had one mortality each year in the CYE.

At this time, it is still unknown whether the grizzly bear population is increasing, decreasing, or remaining static. The existing population is presumed to be below a viable level, making population dynamics especially sensitive to birth rate and mortality. The current plans of the U.S. Fish and Wildlife Service are to continue with the augmentation of the Cabinet Mountain population with up to three additional sub-adult females. One sub-adult female was successfully augmented into the Upper Bull River area in the CYE in 1990.

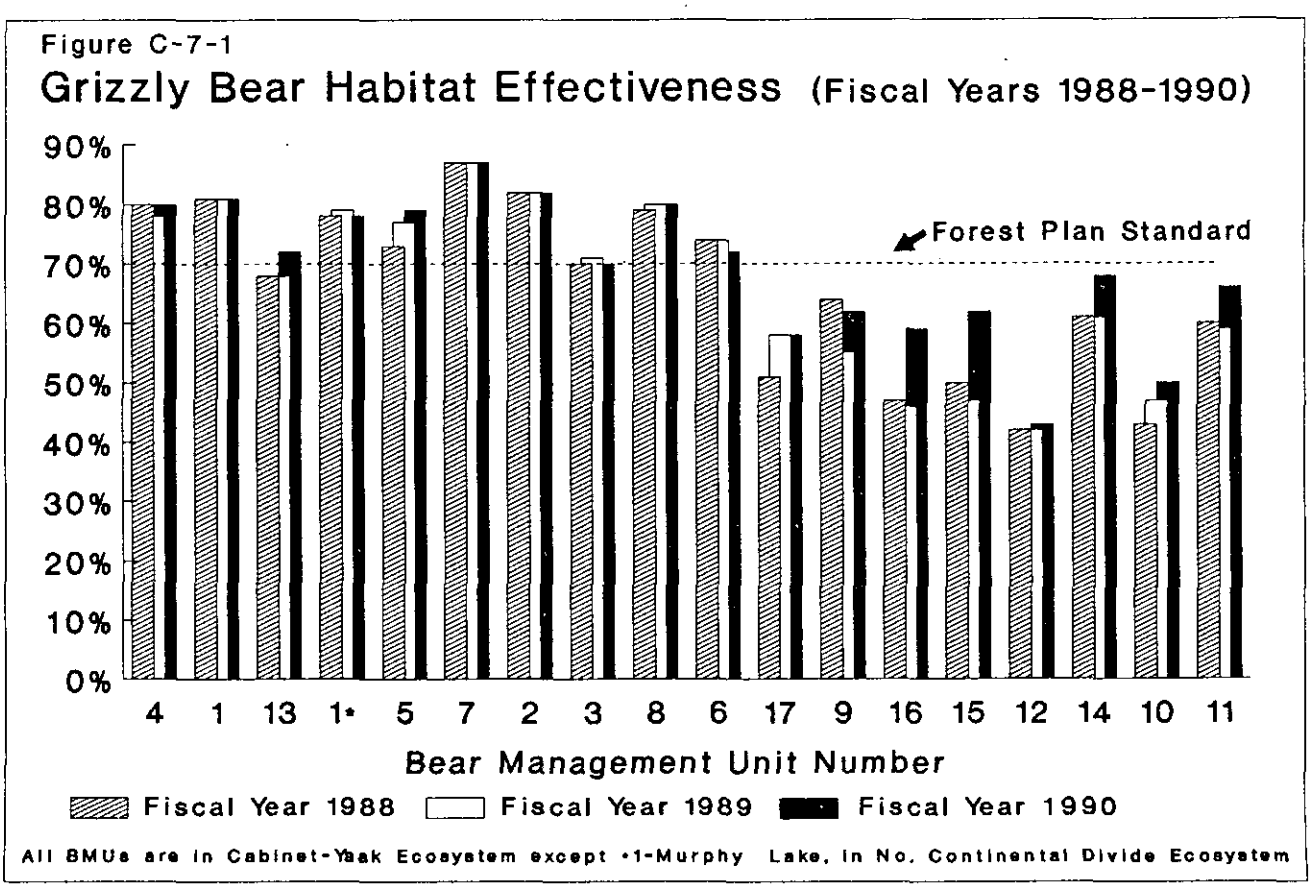
Summary: Most of the T & E species that are being monitored have had increased sightings during the last three years. All of the T & E habitats being monitored appear to be improving or maintaining. All indications at this time are that the Kootenai Forest is progressing toward meeting recovery plan goals.

Table C-7-1 *Grizzly Bear Habitat Effectiveness (%) by Fiscal Year (FY)*

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

[1]MURPHY LAKE #1 is located in the North Continental Divide Ecosystem. All others are in the Cabinet Yaak Ecosystem.

Figure C-7-1



RANGE

Range Use: Monitoring Item D-1

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

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

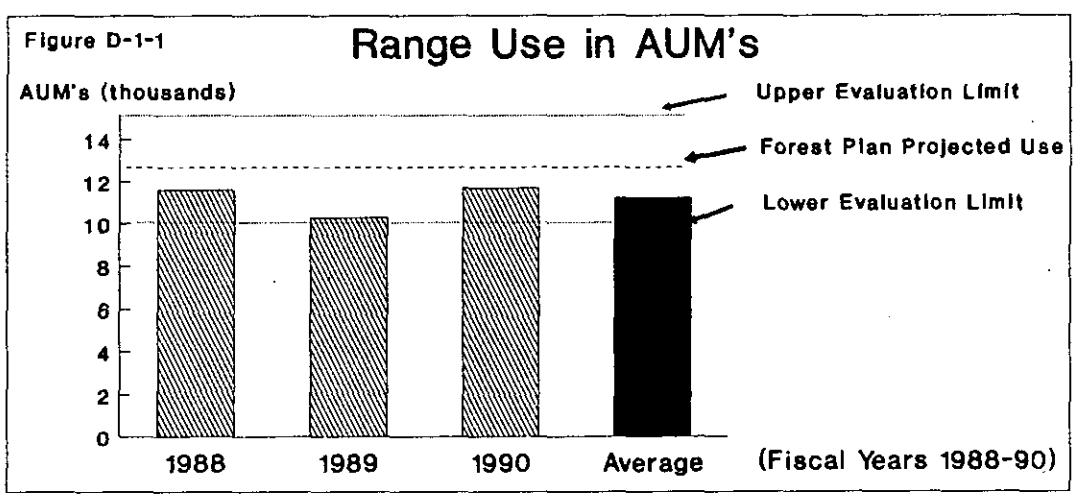
Results: During the last three years, actual use has been less than projected but not to the extent which would initiate further evaluation. The reason for the lower use has been the result of the permittee's requests for non-use.

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

Table D-1-1 Range Use in AUM's

Fiscal Year	Forest Plan Projected Use (AUM'S)	Actual Use (AUM'S)	Actual Use as a Percent of Projected Use
1988	12,600	11,600	92
1989	12,600	10,300	82
1990	12,600	11,700	93
Average	12,600	11,200	89

Figure D-1-1



RANGE

Noxious Weed Infestations: Monitoring Item D-2

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

Background: Forest Plan requirements state that noxious weed infestations will be monitored for increases in total acreage, increases in weed density and the introduction of new weed species on the Forest. There is no baseline inventory available for noxious weed infestations at this time.

Results: Few precise measurements of noxious weeds have been completed to date but there is general agreement that the acres of noxious weeds of the KNF are continuing to increase. The rate of increase is uncertain but thought to be below the level stated in the Plan. Spotted knapweed, dalmatian toadflax and thistles infestations are the primary noxious weed species found. These infestations will probably continue to increase in roaded areas where the soil has been disturbed by road building, maintenance, and timber harvest activities.

In the meantime, research is continuing on the Kootenai in the use of biological controls for knapweed. During 1990, the Western Agricultural Research Station did experimental work on two sites with the knapweed root moth. One site was near Barron Creek on the Fisher River District, and the other was in Marten Creek on the Cabinet Ranger District. The knapweed root moth is an insect that eats the knapweed seedhead. The researchers anticipate that the moth can become established in areas where knapweed is a problem and become an effective natural (biological) control. These sites will be monitored to determine the success of this project.

TIMBER

Timber Sell Volume: Monitoring Item E-1

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

Background: The Forest's projected timber sell volume is 2,270 million board feet (MMBF) for the decade of the Plan (see Forest Plan, Appendix 11). This projection is for suitable management areas and is known as the allowable sale quantity (ASQ). In addition, 60 MMBF are expected to be harvested from unsuitable management areas. These two values total 2,330 MMBF over the 10-year period. In order to have a steady output of timber over this 10-year period, an average annual programmed timber sell would be 233 MMBF/ year.

Results: Timber sell volumes from the suitable lands total 500 MMBF for the first three years of plan implementation (see Table E-1-1). Timber harvest from unsuitable lands totals 8 MMBF. For the suitable lands, a steady output level per year to reach the ASQ for the decade would be 227 MMBF/year. Adding this figure for three years would give a total of 681 MMBF. At this point, the Forest is 180 MMBF below the value expected given even scheduling of timber sales throughout the Plan period.

Evaluation: The suitable and unsuitable timber sell volumes are currently outside the quantitative range prescribed in the Forest Plan (5% and 10%, respectively) but are still within the time frame allowed (5 years). Plans have been prepared to achieve the allowable sale quantity by the end of the Forest Plan period, but monitoring of trends indicates that it will be difficult to achieve (see Water Yield Increases (F-3), Suitable Timber Management Area Changes (E-3), and Timber Harvest Deferrals E-7). Timber Sell Volume will be closely monitored through fiscal years 1991-1992 to ensure that enough information is available to determine whether any changes are needed in the Forest Plan.

Some of the principle reasons for the lower timber sell volumes are:

The identification of additional grizzly bear habitat in the Cabinet-Yaak Ecosystem through continuing formal and informal consultation with the U.S. Fish and Wildlife Service. These changes include 148,000 acres of suitable management areas with increased access restrictions to meet qrizzly bear habitat objectives. As a result, some of the timber harvest planned for such areas has been deferred to outside the current Plan period. The area involved is approximately 11% of the total suitable management area on the Forest (1,263,000 acres).

Higher than expected timber harvesting on intermingled private lands. This resulted in delays of Kootenai Forest timber sales because of hydrologic concerns (see Water Yield Increases (F-3) and Timber Harvest Deferrals (E-7).

A Ninth Circuit Court injunction on timber sales and road construction in the Upper Yaak River. This resulted in the deferral of 59 MMBF of timber sales scheduled for fiscal year 1988.

The new Region 1 utilization standards were not implemented until late in fiscal year 1989. Use of these new standards result in higher volume measure for a given timber stand and are reflective of actual manufactured yield of wood products using current mill technology. The Forest Plan used these new standards, but they were not actually used to prepare and sell timber stands until 1989. This resulted in an estimated 21-34 MMBF deficit in measured volume.

Timber sale preparation budgets have been less than projected in the Forest Plan (see Forest Plan Budget Levels (H-4).

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

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

Old growth validation efforts, which are required prior to most proposed timber sales, often indicate a deficit of existing suitable old growth needed to meet the Forest Plan standard of 10%. When such deficits occur, additional stands are identified to bring the area under analysis up to the required 10%. This additional acreage of mature sawtimber needed must come from the suitable management areas if mature timber in unsuitable lands is not available. Sometimes these mature sawtimber stands in the suitable timber base were previously scheduled for timber harvest during the Plan period (see Suitable Timber Management Area Changes (E-3).

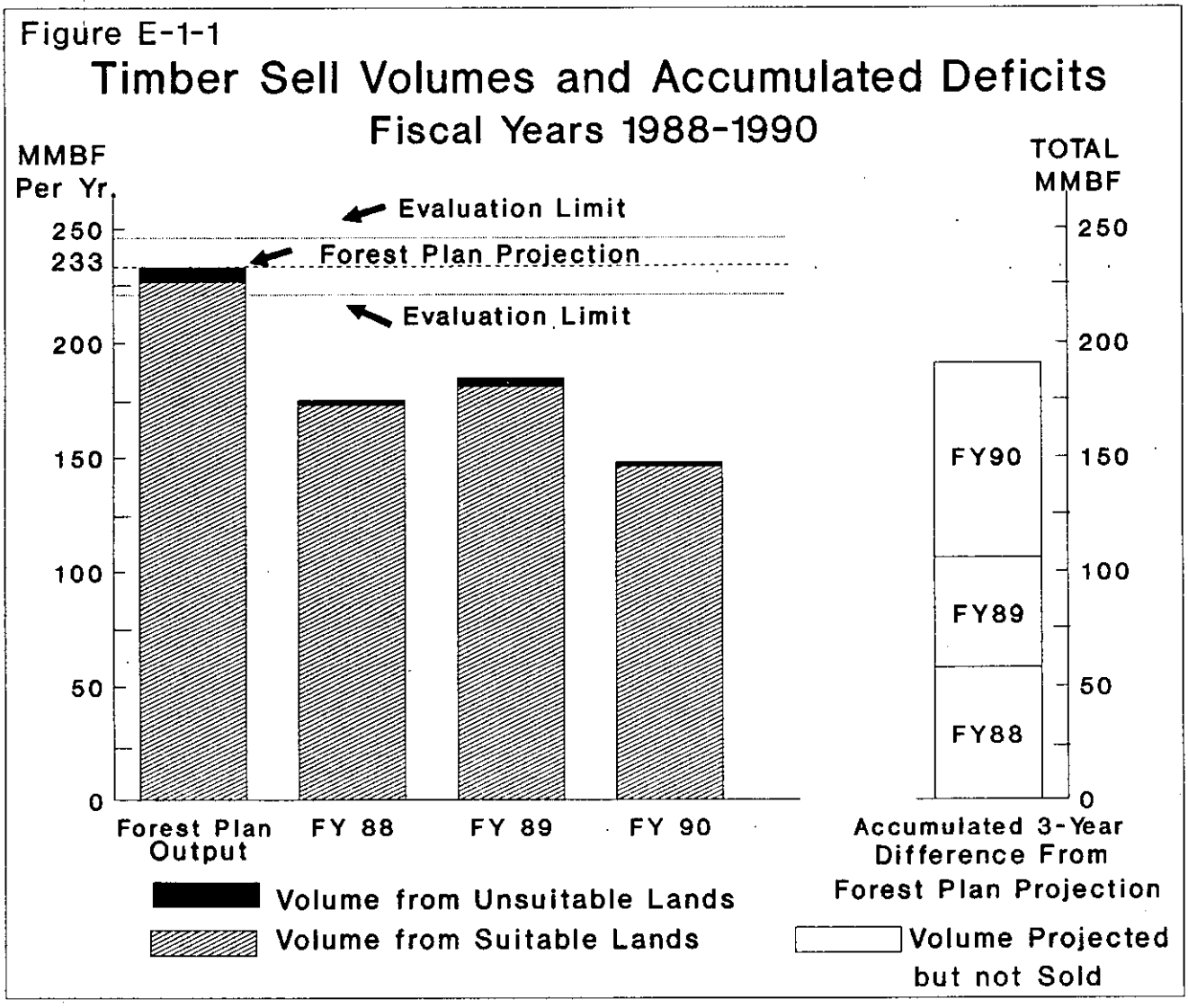
For more detailed information concerning the timber sell program, see Appendix B.

Table E-1-1 Timber Sell Volumes (MMBF)*

Forest Land Classification	Forest Plan Projec-tion	Fiscal Year 1988	Fiscal Year 1989	Fiscal Year 1990	Average Timber Sell per year	Total Timber Sell 1988-90	Deviation From Forest Plan
Suitable Lands	2,270	173	181	146	167	501	180
Unsuitable Lands	60	2	4	2	3	8	10
Total Timber Sell Program	2,330	175	185	148	170	509	190

* Totals may not always be exact because of rounding.

Figure E-1-1



TIMBER

Acres Sold for Timber Harvest: Monitoring Item E-2

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

Background: The Forest Plan projects 15,740 acres of annual regeneration harvests to achieve the allowable sale quantity (ASQ). (See Timber Sell Volume, monitoring item E-1.) Regeneration harvests include clearcut, seedtree, and shelterwood cutting methods.

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

Table E-2-1 shows the acres sold for timber harvest in fiscal years 1988-1990 and compares them to the Forest Plan projections by MA.

Results: The total average acreage sold for regeneration harvest is below the Forest Plan projection and indicates a downward trend since FY 88 (10,440 acres or 66% of the projected level of 15,740 acres--see Table E-2-1). This shortfall of timber acreage sold and downward trend closely correlates to the level and trend of timber volume sold since FY 88 (see Timber Sell Volume, E-1).

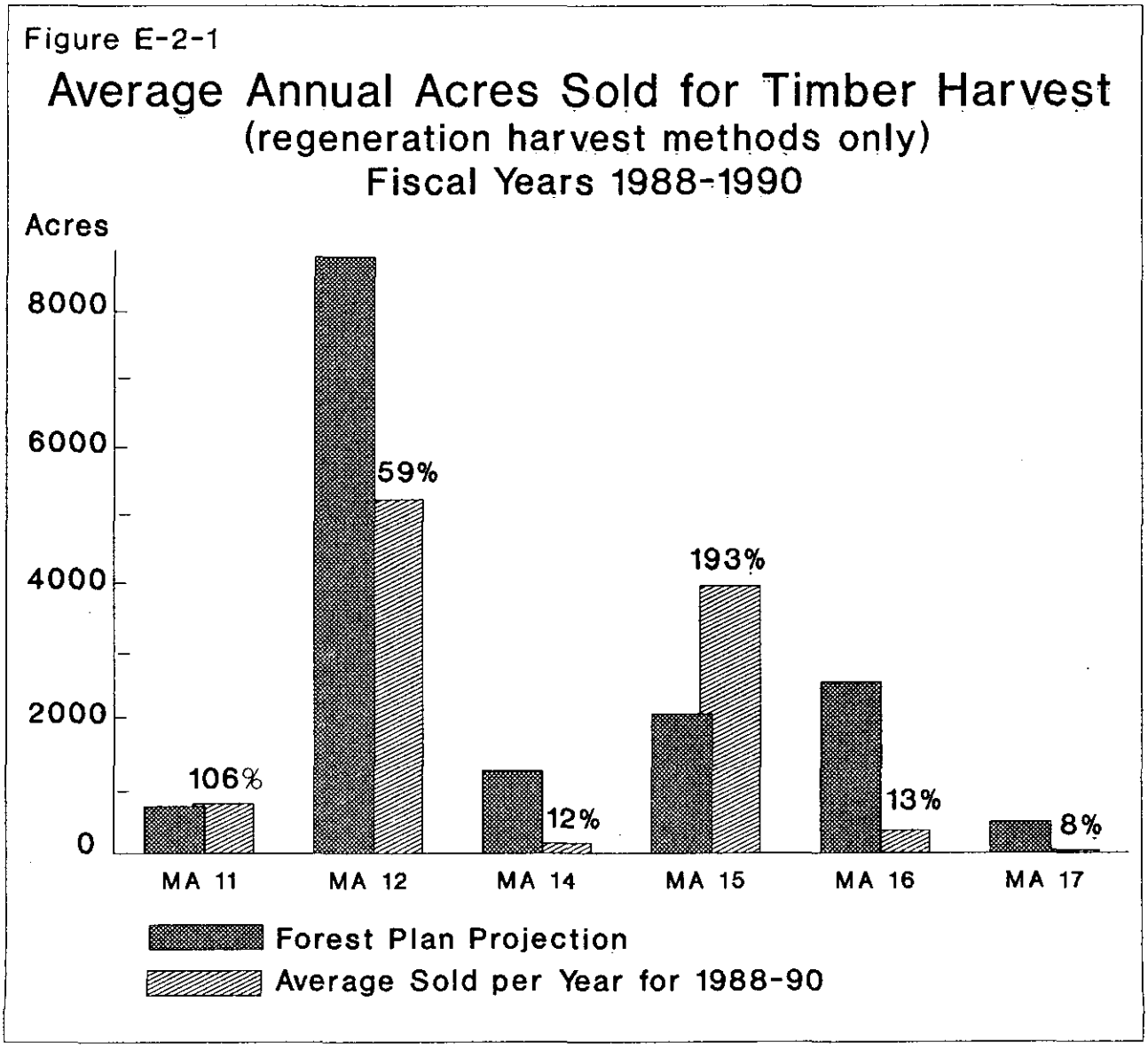
In contrast, the acreage sold in MA 15 is 93% above the projected level. Three of the six suitable timber MA's are significantly below the Forest Plan projected level (MA 14, 16, 17).

Evaluation: MA 15 is primarily oriented to timber production and has the least conflict with other resources such as big game, visual quality, threatened and endangered (T & E) species, etc. Because of the Forest goal to harvest as much dead and dying lodgepole pine as quickly as possible, timber sales have been emphasized in MA 15. This MA also contains an extensive road network which allows immediate access to the insect-infested timber. The combination of existing access and low resource conflict has allowed the most efficient response to the pest and maximization of timber salvage (see Budget Levels, H-4). However, at this point, the high level of timber sales prepared to harvest lodgepole pine beetle-killed timber is declining as it has effectively been harvested and because further harvest would make it difficult to meet other Forest Plan resource objectives. As a result, it is expected that proportionately fewer acres of MA 15 will be harvested and there will be a relative increase in harvest of other suitable management areas. This trend should moderate some of the acreage discrepancies displayed in Table E-2-1.

Table E-2-1 **Acres Sold for Timber Harvest** (regeneration harvest methods only)

Management Areas (MA's)	Forest Plan Projected Acres	Fiscal Year 1988	Fiscal Year 1989	Fiscal Year 1990	Average Sold per Year	Percent of Forest Plan Projection
11	690	696	665	831	731	106
12	8,800	6,518	5,431	3,729	5,226	59
14	1,220	170	139	142	150	12
15	2,050	3,513	4,574	3,790	3,958	193
16	2,520	325	416	277	339	13
17	460	55	10	47	37	8
Total	15,740	11,277	11,235	8,809	10,440	66

Figure E-2-1



TIMBER

Suitable Timber Management Area Boundary Changes: Monitoring Item E-3

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

Background: The allowable sale quantity (ASQ) calculated for the Plan is partially dependent on the amount of suitable timber acreage. This acreage is located within management areas (MA) 11, 12, 14-17. These MA's are validated during site-specific project analysis. When errors are found, a MA boundary correction is made to keep the Forest Plan MA Map and acreage current. MA boundary changes can result in gains or losses in MA acreage, depending on the conditions found on-the-ground. The important items to track are the total changes by MA and the net gains or losses in suitable timber acreage.

The most commonly found conditions that cause a MA map change are: mapping and drafting errors found on the original maps; non-productive forest land located within a MA that is mapped as productive (the reverse situation is also found); big-game winter range habitat non-existing where originally mapped (the reverse is also found); grizzly bear habitat existing where previously unmapped; the absence of old-growth timber habitat and the need to designate additional acreage to meet the 10% minimum standard.

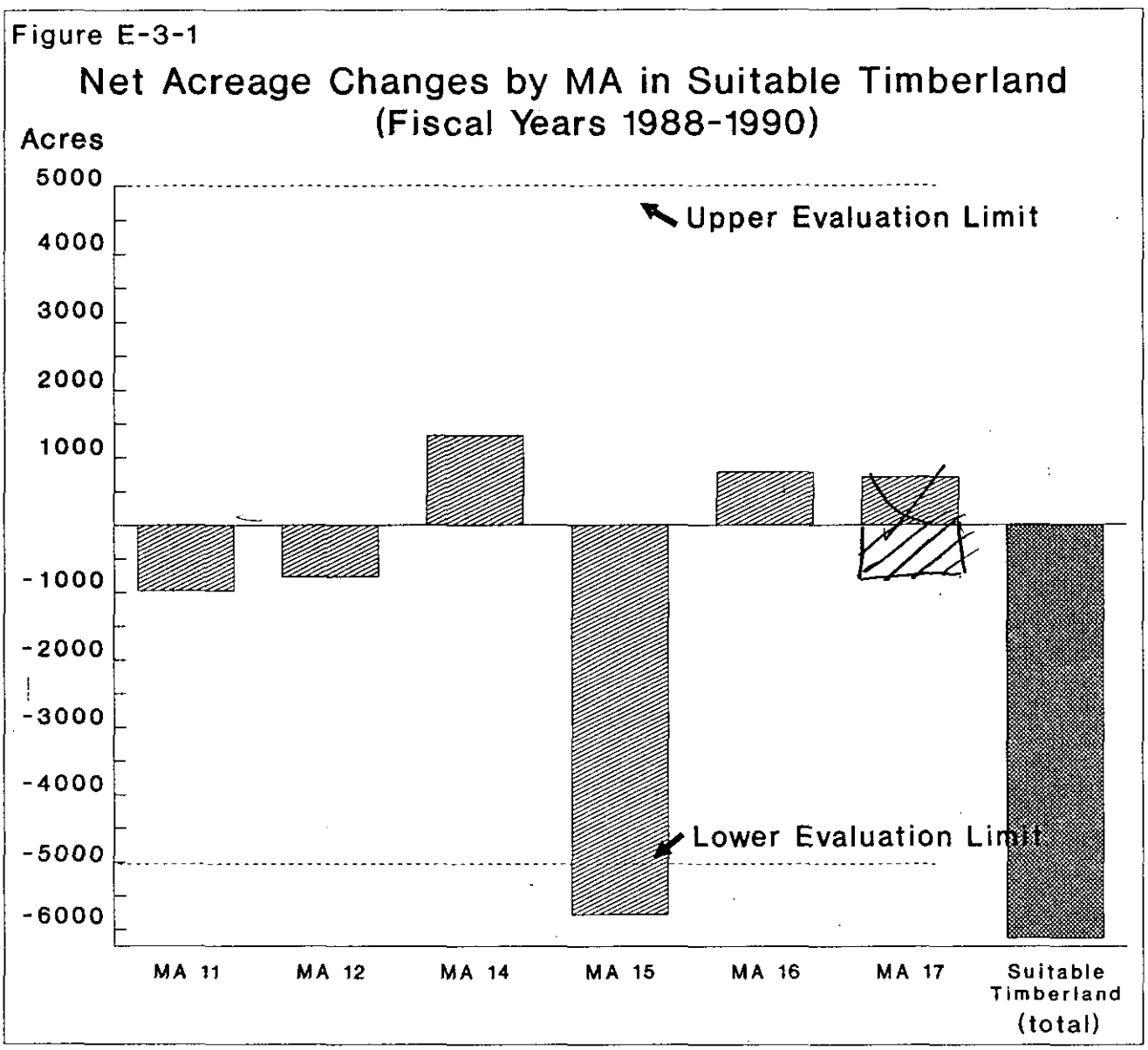
Results: Table E-3-1 displays the net MA acreage changes for fiscal years 1988-90 and the net change in the suitable timber base. Total net losses in the suitable timber base have doubled in FY 1990 over the previous two fiscal years. **NOTE**: The totals shown are exclusive of the MA acreage changes which have already been made in Forest Plan Modification #2, issued in February, 1989. That amendment was made to display the gain of 4,650 acres in MA 11 and a loss of 4,750 acres in MA 14 within the Yaak Ranger District, now part of the Three Rivers Ranger District. The net loss of suitable timberland in Forest Plan Modification #2 was 466 acres.

Evaluation: The cumulative MA changes in MA 15 are now beyond the +/- 5,000 acres total change limit. If this total doesn't revert in the next two years, it may be necessary to amend the Forest Plan following the 5-year review period (beginning in FY 1993). The most significant changes in FY 1990 were a result of errors found on-the-ground in old growth timber habitat, big game summer and winter range, sensitive visual resource areas, and nonproductive forest land. The total cumulative change in the suitable timber base is now -6,586 acres or a loss of five-tenths of one percent (-6,120 acres shown below plus -466 acres included in Forest Plan Modification #2).

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	+1,316	-661	-4,332
Total Net MA Change	-976	-765	+1,326	-5,780	+784	-709	-6,120

Figure E-3-1



TIMBER

Timber Harvest Deferrals: Monitoring Item E-7

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

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

To determine the effect of harvest deferrals on the timber sale program, monitoring is done in two different categories. **Category A** deferrals are those that result from our project specific conclusions regarding resource or economic conflicts not adequately accounted for in the Forest Plan. Examples are: road construction that was too expensive, or a threatened or endangered species found during project planning which was unknown during Forest Planning. **Category B** deferrals are those that result from an externally-imposed situation. Examples include: appeals and court injunctions, or significant timber harvest on adjacent private land which could result in cumulative watershed damage if the National Forest timber was also harvested before adequate watershed recovery occurred on the private land. (Please note that suitable timber acres rescheduled from one year to a later year within the Forest Plan period (FY's 1988-1997) are not considered deferred.)

Results: Table E-7-1 displays deferred harvest acres by category for each suitable timber management area on the Forest for FY's 1988-90. The results show total harvest deferrals for each category in FY 90 were lower than FY 89.

Evaluation: In **Category A**, during FY 90, almost 1,400 acres were deferred. Poor timber sale economics was the cause of almost half of the deferrals (672 acres). Adjacent cutting units not adequately regenerated yet to provide hiding cover for wildlife, and old-growth replacement were the next most frequent reasons harvest was deferred (203 acres and 209 acres, respectively).

In **Category B**, during FY 90, almost 2,800 acres were deferred. Timber harvest on adjacent private land was the cause of most of the deferrals (2,387 acres). These deferrals were necessary to insure that Forest Plan watershed guidelines were not exceeded (see Water Yield Increases, F-3).

For FY's 88-90, MA 12 shows 9,319 acres deferred. This is the largest amount of all the MA's, but still within the Forest Plan limit of 10,000 acres. If the current rate of deferrals continues, the 10,000 acre limit will be exceeded during FY 91.

The grand total cumulative deferred MA acreage of over 14,200 acres is equivalent to 1% of the 1,263,000 acre suitable timber base of the Forest.

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
***Subtotal for* Category A**	199	3,553	200	316	436	0	4,704
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
Subtotal for Category B	601	5,766	637	2,244	198	88	9,534
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
MA Totals for FY's 1988-90	800	9,319	837	2,560	634	88	14,238

Figure E-7-1

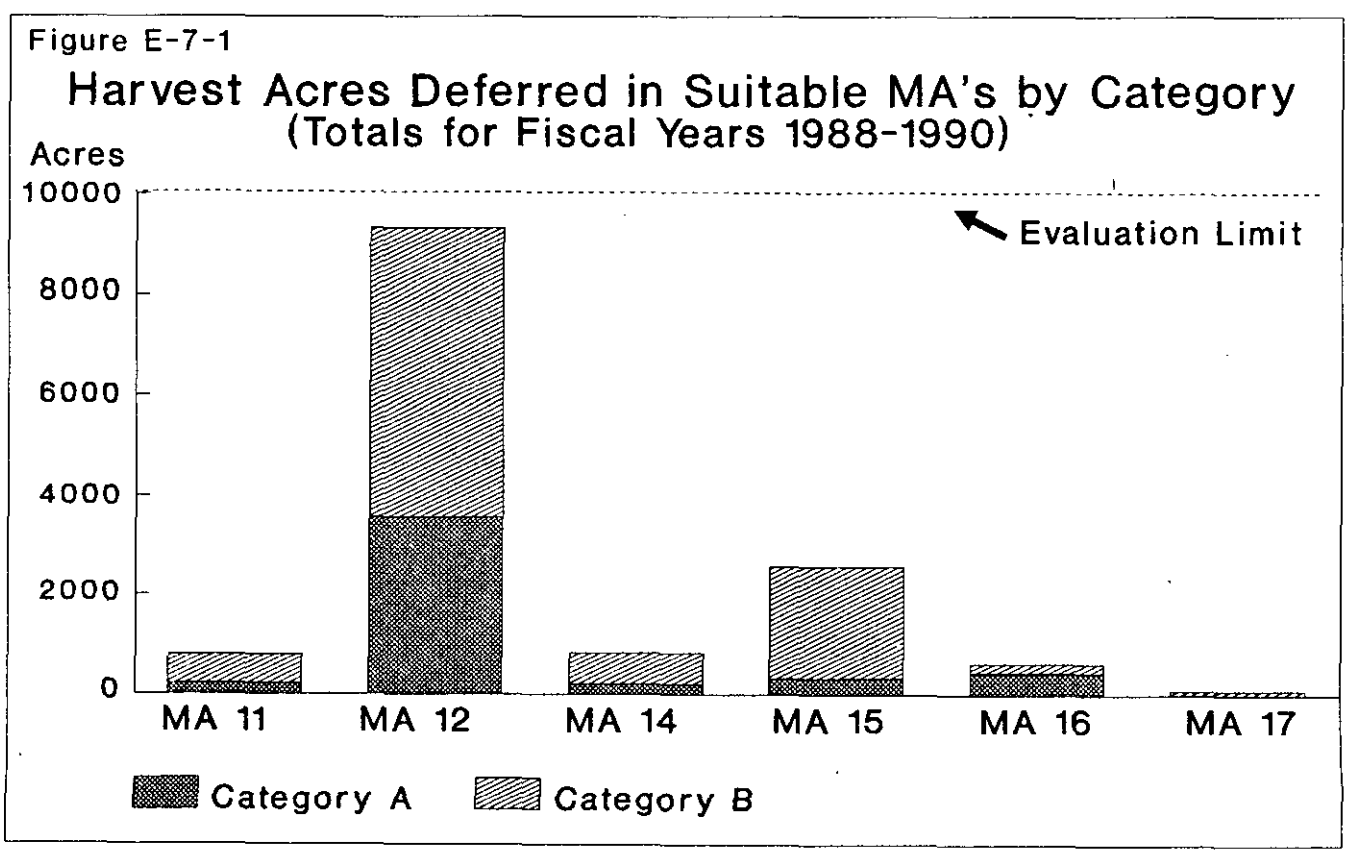
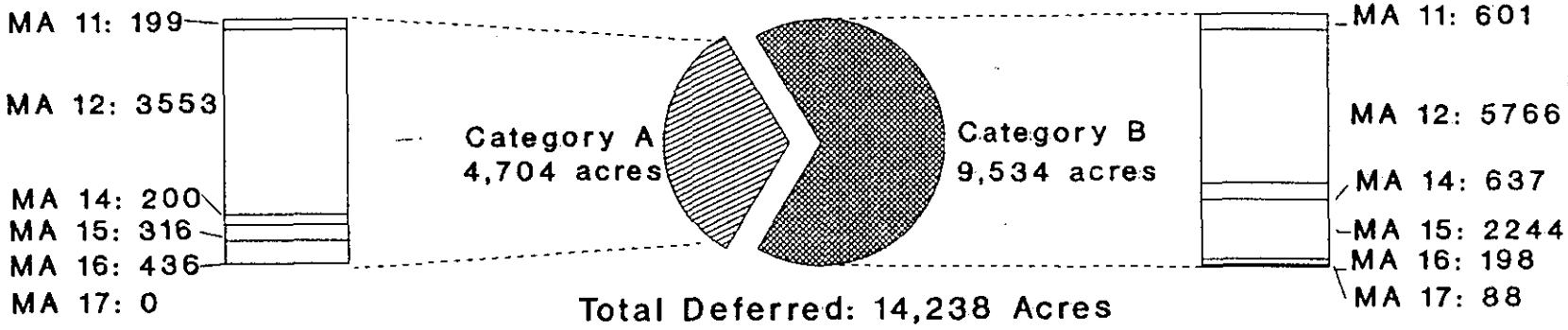


Figure E-7-2 Harvest Acres Deferred in Suitable Timber MAs

Total Acres for Fiscal Years 1988-1990



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.

SOIL AND WATER

Soil and Water Conservation Practices: Monitoring Item F-1

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

Background: Starting in October, 1988, the Forest began monitoring the Soil and Water Conservation Best Management Practices (BMP's). These BMP's are required forestwide to meet State water quality standards. The BMP's are various practices (such as erosion control) which are designed to reduce non-point sources of pollution. (A primary non-point source of pollution on a national forest is sediment which can reach a stream.) BMP monitoring consists of: **(1)** determining whether the practice (BMP) was applied on the ground as called for, and **(2)** if applied correctly, did it reduce the chances for sediment to enter a streamcourse. The determination of proper BMP application is referred to as IMPLEMENTATION MONITORING. The determination of whether the BMP worked or not is EFFECTIVENESS MONITORING.

In addition to designing and evaluating the various practices (BMP's), the Forest also collects water samples near project sites to further ensure that downstream beneficial uses are being protected.

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

Fiscal year 1990 BMP monitoring on the Kootenai Forest involved two different groups: BMP monitoring done by Kootenai Forest personnel during their normal work activities; and BMP monitoring of six timber sales on the Kootenai Forest done by the Montana Department of State Lands (Forestry Division). This BMP monitoring done by the State of Montana was part of a larger State-wide BMP audit. It was done by a special team comprised of a fisheries biologist, a forester, a hydrologist, a soil scientist, a logging/road engineer, and a representative of a conservation group.

In both of the groups, BMP's were evaluated at particular sites on the various projects described above. The IMPLEMENTATION evaluations and the EFFECTIVENESS evaluations were both rated on the following scale:

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

RATING	IMPLEMENTATION	EFFECTIVENESS
Exceeds Acceptable	Operation Exceeds Requirements	Operation Improved Protection of Soil and Water Resources
Acceptable	Operation Meets Requirements	Adequate Protection of Soil and Water Resources
Unacceptable	Minor Departure From Intent	Minor and Temporary Impact
Very Unacceptable	Major Departure From Intent	Major and Temporary, or Minor and Prolonged Impact
Grossly Unacceptable	Gross Neglect or No Application At All	Major and Prolonged Impact

Results:

BMP Monitoring by Kootenai Forest Personnel: During FY 90, 1,381 IMPLEMENTATION evaluations were completed. Ratings of acceptable and better were given 96% of the time. Ratings of unacceptable or worse were given 4% of the time. EFFECTIVENESS evaluations were completed for 202 of the 1,381 BMP applications. Of this group, ratings of acceptable and better were given 91% of the time. Ratings of unacceptable or worse were given 9% of the time.

Table F-1-2 BMP Monitoring Done by Kootenai Forest Personnel

RATING	IMPLEMENTATION (%)	EFFECTIVENESS (%)
Exceeds Acceptable	0	0
Acceptable	96	91
Unacceptable	4	8
Very Unacceptable	0.4	1
Grossly Unacceptable	0	0

BMP Monitoring Done By the State BMP Audit Team: The interdisciplinary State review team evaluated six timber sales for BMP IMPLEMENTATION and EFFECTIVENESS. Of the 221 BMP's evaluated for IMPLEMENTATION, 84% were rated acceptable or better, and 16% were rated as unacceptable or worse. For those same 221 BMP's, the evaluations for EFFECTIVENESS were: 86% rated acceptable or better, and 14% rated unacceptable or worse.

Table F-1-3 BMP Monitoring Done by the State BMP Audit Team

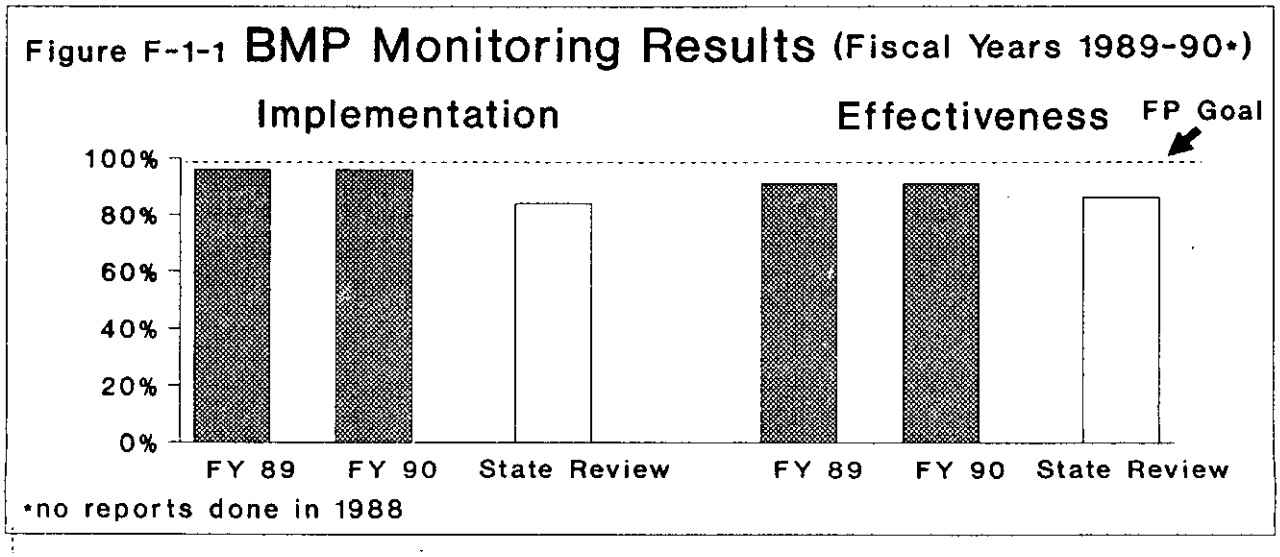
Rating	IMPLEMENTATION (%)	EFFECTIVENESS (%)
Exceeds Acceptable	0	0
Acceptable	84	86
Unacceptable	13	10
Very Unacceptable	3	4
Grossly Unacceptable	0	0

Evaluation:

The results of the FY 90 Kootenai Forest BMP monitoring evaluations can be compared to those made last year. During FY 89, ratings were similar (96% for acceptable or better IMPLEMENTATION evaluations and 91% for acceptable or better EFFECTIVENESS). Based upon a larger sample size in FY 90, it's probable that the FY 90 sampling is a more accurate reflection of the overall Forest conditions even though it doesn't reflect any overall improvement over FY 89.

The results of the State audit on the Kootenai indicates a lower rating of successful application of BMP's than reported by the Forest's own monitoring. Some of these differences may be explained by the limited sampling (221 vs. 1,381 practices evaluations). The State audit on the Kootenai shows a score of 84% for acceptable or better BMP IMPLEMENTATION, and 86% for acceptable or better BMP EFFECTIVENESS. Although the State audit does show a lower overall rating than that indicated by Kootenai Forest personnel, it's helpful to know that in comparison to other locations in the State audit, the Kootenai Forest was rated above the State averages. The State averages determined by the State BMP Audit Team were 78% for acceptable or higher BMP IMPLEMENTATION and 81% for acceptable or higher BMP EFFECTIVENESS.

No matter what group is doing the BMP evaluations, it is clear that more effort is necessary to turn unaccepatble ratings into acceptable ratings. This will require that the Forest continues with BMP training and followup to maintain and improve the efforts currently being made in BMP monitoring. This should include close attention to BMP application in all aspects of project planning, contract preparation and administration.



SOIL AND WATER

Stream Sedimentation: Monitoring Item F-2

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

Background: The Forest Plan identified seven streams to install monitoring stations to measure bedload and suspended solids. Upon further evaluation, it was realized that the streams selected were too large and would not provide meaningful data for the purposes of sedimentation monitoring. Smaller tributaries within the Big, Sunday and Bristow Creek drainages were then selected for monitoring purposes.

Results: Initial data collection is underway at Red Top and Granite Creeks. Turbidity and suspended solids information is being collected at both locations, and bedload sampling is also occurring at Red Top Creek. In addition to Forest Service monitoring, both Asarco and Noranda Corporations are collecting baseline data in conjunction with mining proposals and operations.

Evaluation: At this time, there is not enough data available for evaluation.

Water Yield Increases: Monitoring Item F-3

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

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

Results: In FY 1990, the Kootenai water yield model was used to estimate the peak flow increase for 143 watersheds on 394,200 acres which included both National Forest and private land (see Table F-3-1). Of the 143 watersheds, 28 exceeded the Forest water yield guidelines. These 28 watersheds, located on 89,000 acres, account for 20% of the watersheds analysed and 23% of the acres analysed in FY 1990. These percentages are a decline from the 86 watersheds and 330,000 acres resulting in FY 1988-89.

Evaluation: The combined totals for FY's 1988-90 show that of the 480 watersheds analysed for peak flow increases on 1,604,000 acres of both public and private land, 114 watersheds on 419,000 acres still exceed limits in water yield increase (see Table F-3-1). Most of the analysed watersheds occur on the Fisher River Ranger District (198), which has also experienced the most watersheds that exceed the water yield limits (82 on 314,000 acres). This Ranger District is located in the southeast corner of the Forest in an area which contains large segments of intermingled private land.

Significant amounts of timber harvest has recently occurred on the intermingled private land within the Forest. Water yield calculations were done for these drainages as a part of project planning for potential Kootenai Forest timber sales, and the private land characteristics were included. Most of these drainages were found to exceed allowable peak flow levels, even though there were few recent or planned activities on National Forest lands within these drainages. As discussed in Harvest Deferrals (E-7), the Forest has deferred harvest for this reason during 1988-1990.

Since a disproportionate number of drainages which have been studied in fiscal years 1988-1990 have significant amounts of private land, the figure of 24% of watersheds exceeding limits probably still overstates the actual Forestwide situation. This assumption is made because the percentage rate of watersheds exceeding guidelines has declined from 26% in FY 1988-89 to 20% in FY 1990. One of the reasons is that less private land was included in the FY 1990 areas. It is believed that the Forestwide percent tally of drainages that exceed the water yield limit will continue to decline as watersheds with fewer inclusions of private land are added to the list of watersheds studied. In order to confirm that this assumption is correct, the Forest is also monitoring the percent of land area to track this monitoring item (see Figure F-3-2). Although it appears that the overall Forest will eventually be in compliance with this monitoring item, the locations on the Forest with intermingled landownerships will still be significantly affected. These areas are primarily located in the southeast corner of the Forest where the Montana Watershed Co-operative has agreed to evaluate harvest schedules and methods to ensure that State Water Quality standards are met. This co-operative includes the Kootenai, Flathead and Lolo Forests, the State of Montana, Plum Creek Timber Company, and Champion International Corporation.

Table F-3-1 Watersheds Analysed Using Water-Yield Guidelines

Ranger District	FY's 88-89 Number of Watersheds Analysed	Number of Watersheds Exceeding Water Yield Guidelines	Per-cent	Acres of Watersheds Analysed (includes private land)	Acres of Watersheds Exceeding Water Yield Guidelines (includes private land)	Per-cent
Rexford	8	1	12	73,500	7,700	10
Fortine	13	0	0	42,000	0	0
Three Rivers	107	6	6	491,000	58,500	12
Libby	49	9	18	30,000	755	3
Fisher River	144	68	47	543,000	261,500	48
Cabinet	16	2	12	31,000	2,300	7
Totals	337	86	26	1,210,000	330,155	27

Ranger District	FY 1990 Number of Watersheds Analysed	Number of Watersheds Exceeding Water Yield Guidelines	Per-cent	Acres of Watersheds Analysed (includes private land)	Acres of Watersheds Exceeding Water Yield Guidelines (includes private land)	Per-cent
Rexford	7	0	0	27,200	0	0
Fortine	32	5	16	58,200	8,900	15
Three Rivers	30	1	3	56,600	1,400	2
Libby	11	8	73	48,500	26,100	54
Fisher River	54	14	26	174,300	52,800	30
Cabinet	9	0	0	29,400	0	0
Totals	143	28	20	394,200	89,200	23

Ranger District	FY's 88-90 Total Number of Watersheds Analysed	Number of Watersheds Exceeding Water Yield Guidelines	Per-cent	Total Acres of Water-sheds Analysed (includes private land)	Acres of Watersheds Exceeding Water Yield Guidelines (includes private land)	Per-cent
Rexford	15	1	7	100,700	7,700	8
Fortine	45	5	11	100,200	8,900	9
Three Rivers	137	7	7	547,600	59,900	11
Libby	60	17	28	78,500	26,855	34
Fisher River	198	82	41	717,300	314,300	44
Cabinet	25	2	8	60,400	2,300	4
Totals	480	114	24	1,604,200	419,355	26

Figure F-3-1

Watersheds and Total Acres Exceeding Water-Yield Guidelines
(Fiscal Years 1988-90)

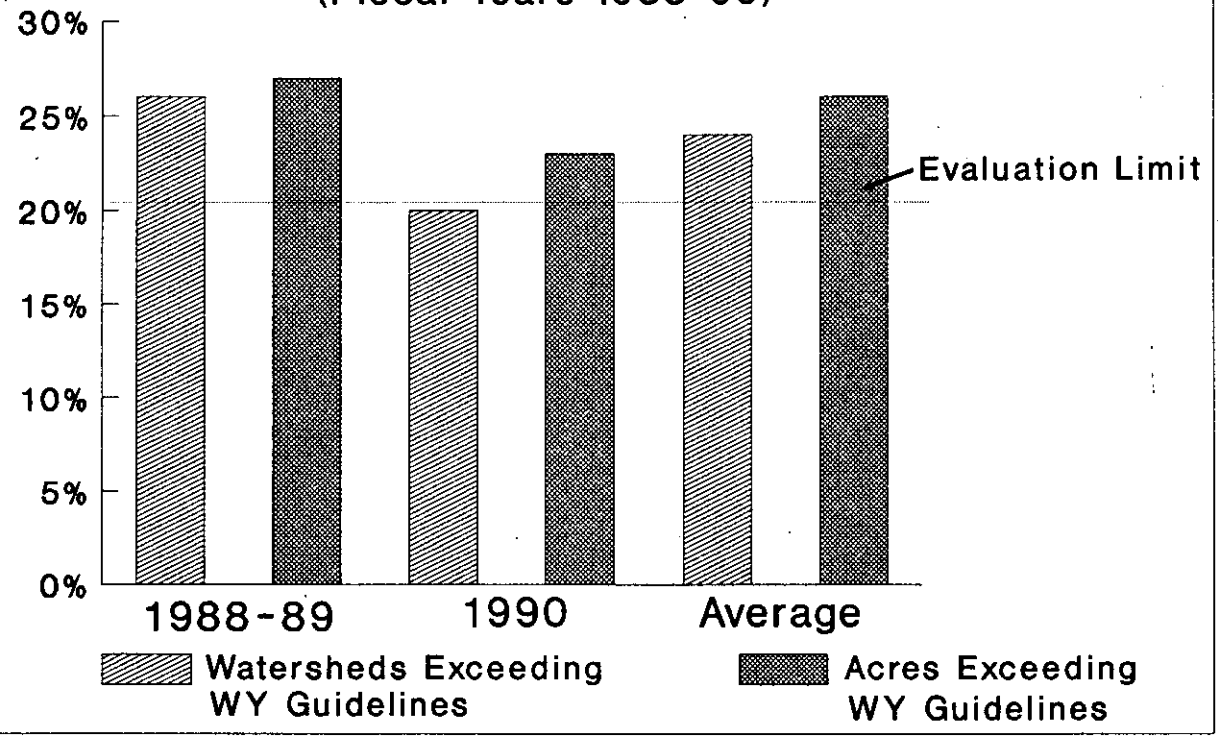
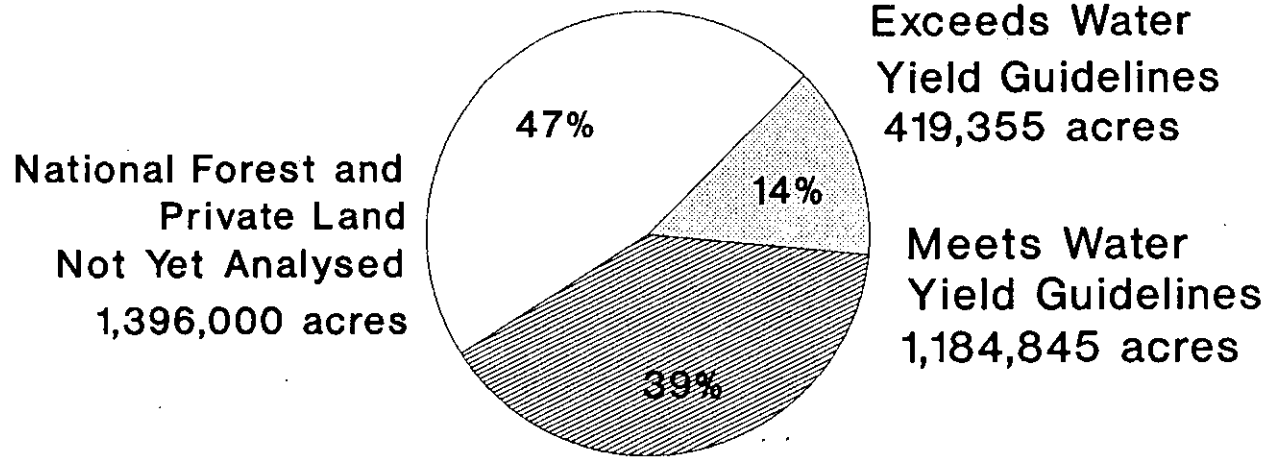


Figure F-3-2

Kootenai Forest Land Areas Analysed Using Water-Yield Guidelines: Fiscal Years 1988-90



Total National Forest and Private Land
3,000,000 acres

HUMAN AND COMMUNITY DEVELOPMENT

Emerging Issues: Monitoring Item H-2

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

BACKGROUND: Newly emerging issues could affect the Forest's ability to implement the Forest Plan as intended. As a part of monitoring, such potential issues will be identified. At the 5-year review, an analysis will be made to determine if these potential issues could significantly affect programmed output levels or the full implementation of Forest Plan standards and guidelines. In addition to monitoring emerging issues, the Forest is monitoring the original Forest Plan issues to understand how they may be changing and to determine if the Plan is resolving them in the intended fashion. In fiscal year 1990, many of the previous years concerns were validated with some additional emphasis added, as well as a few new concerns being mentioned.

Emerging or Potential Forest Issues Not Addressed in the Forest Plan:

Air Quality Management - Air quality is addressed in the Forest Plan but the profile of the issue is increasing. It appears that some concerns focus on the smoke from timber harvest slash burning in the Spring and Fall.

Biodiversity - Management of biodiversity is an issue which is increasing nationally. The Forest Plan considered vegetative and wildlife diversity, but there are new concepts of biodiversity such as landscape ecology that may need to be applied. The Forest Service "New Perspectives" initiative may eventually address these concerns, but the effect of biodiversity issues on the Forest Plan is unknown at this time.

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

Non-system Road Management - On gentle terrain, the use of off-road vehicles can create travelway corridors. These unplanned corridors can result in vehicular traffic in areas which were not anticipated. Some of this traffic could have negative implications for wildlife management.

Nutrient Recycling - This emerging issue concerns how much woody material should be left on the ground following timber harvest operations. As a result of whole tree yarding techniques and utilization of smaller diameter trees, the amount of organic material left on site appears to be diminishing. The long-term effects are unknown.

Sensitive Plants and Animals - There is increasing concern for sensitive species management to ensure that such plants and animals will not become threatened or endangered. Inventory and management of these plants is becoming more encompassing as more species are listed and awareness increases.

Continuing Forest Issues that may Affect the Forest Plan:

Grizzly Bear Management - Standards for grizzly bear habitat management are continuing to evolve, and some aspects were not well clarified during Forest planning activities. Clarification items have included habitat delineation, displacement areas, recovery time between activities, and road restrictions. These have had significant effects on timber sale scheduling and have also affected other resource use such as recreation and mining.

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.

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. This model is used to calculate compliance with the Forest Plan water quality standards. These standards require adherence to the State Water Quality Standards.

Timber Supply - This issue is becoming a concern for the economic well-being of the local communities because of their strong dependence on National Forest timber. Concern with timber supply is the cumulative effect of:

(1.) a court injunction and appeals on timber sales and their delaying effect on the timber sale schedule;
(2.) deterioration and resultant volume loss of the dead and dying lodgepole pine timber due to timber sale delays;
(3.) delays resulting from the increased time needed to complete environmental impact statements for timber sales in inventoried roadless areas;
(4.) the identification of additional grizzly bear habitat;
(5.) greater than anticipated harvest on intermingled private lands;
(6.) the clarification concerning the miles of open roads permitted within management areas 12 and 14 and the result on the planned timber sale schedule;
(7.) the clarification of timber harvest guidelines for riparian areas;
(8.) greater than anticipated loss of ponderosa pine volume because of pine beetle infestation;
(9.) the need to provide green leave-trees for future snags for small animal and bird populations;
(10) old-growth habitat validation to provide a minimum of 10% old-growth in each compartment or sub-drainage.

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

Snag Habitat Management - Concern is growing that serious shortages of snag habitat may be developing in many locations on the Forest. This could be the result of previous timber harvest practices and firewood gathering.

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

Wolf Recovery - The Forest Plan provides general guidance for wolf recovery, primarily in the northeast corner of the Forest. Recent experience suggests that wolf recolonization is occurring and will continue to increase outside designated recovery areas. What effects this would have on other resource uses are unknown at this time.

Roadless Area Partitioning for Timber Harvest Plans - A new approach for measuring timber sell levels has been presented by the Regional Office. This approach would provide for two separate calculations of the allowable sale quantity (ASQ). One calculation would measure the maximum amount of timber that should be harvested on roaded lands within any Forest Plan standards. The other calculation would measure the maximum amount of timber that should be harvested in roadless areas in a similar fashion. Neither of these two amounts could be interchanged. At this point, it is not known if this increased complexity in regulating harvests would have any significant effect on the timber supply, the local economy, or the planning process.

HUMAN AND COMMUNITY DEVELOPMENT

Forest Plan Costs: Monitoring Item H-3

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

Background: During the development of the 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 certain of the variable costs can be readily used to determine changes in unit costs. However, these 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.

Results: Cost analysis was undertaken for timber sale preparation and administration, roads constructed primarily for timber harvest, site preparation, reforestation, and precommercial thinning. Baseline unit cost figures, or those used to calculate present net value (PNV) in the Plan, were extracted from the planning record, and inflated to fiscal year 1990 dollars, in order to provide comparability. Unit cost values were obtained from Forest accounting reports and the Forest management attainment reports and inflated to fiscal year 1990 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 cooperative work. All acres with reforestation work are represented in the output level. Table H-3-1 shows the baseline, and FY's 1988-1990 unit cost data for these items.

Evaluation: Care should be exercised while interpreting unit cost information on a yearly basis. Exceptional one-time events can skew single year figures and provide misleading impressions. Also, the best way to consider the data is to look for trends and provide reasonable explanation of those apparent trends.

As can be seen on Table H-3-1, timber sale preparation unit costs were stable at the projected level for FY's 88-89. However, in FY 90, there was about a 40% increase in unit costs. At this point, it's too early to know how much of this is attributable to single-year exceptional costs or to the development of a new trend. Single-year exceptional costs in FY 90 are largely related to the development of the Yaak EIS. Trends which may be surfacing include increasing complexity in timber sale preparation, more intensive analysis work for resource management planning, and a decrease in timber volume being sold. For further discussion of these trends, please reference Items E-1, 2, 3, and 7. The effect of these potential trends will be evaluated during the 5-year review process. At that point, more data will be available to understand the current cost structure of the Forest.

Timber road costs are continuing to remain less than projected. Apparently, the trend seen for fiscal years 88-89 is still in place. A brief analysis of these costs indicated that proportionally more areas which were already roaded contributed to timber harvest during FY's 88-90. This is partially a result of accelerated lodgepole pine timber salvage harvesting in the most economically attractive areas. As treatments of such areas are completed, the trend in decreasing road costs is expected to stabilize or reverse. In addition, increased complexity involved in preparing sales has slowed the rate of development in unroaded areas. When more road building in such areas is undertaken, the relative unit cost of roads per volume produced may increase proportionately.

Reforestation unit costs for FY 90 decreased about 10% from FY 89. Costs for both FY's 1989-90 are considerably below the values shown for FY 88. However, as mentioned earlier, it's difficult to make conclusions with limited data because work programs are affected by swings in actual harvest levels, scheduling of District work programs, and seedling availability and costs. The high cost in FY 88 appears to have been due to some of these effects. Collection of data for two more years should clarify if these unit costs will remain consistent at levels centered about the projected level.

The Forest's monitoring report for FY's 1988-89 discussed changes in the unit costs for precommercial thinning. Examination at that time showed that the baseline costs originally used to calculate Forest present net value had been underestimated. However, since precommercial thinning accounts for only about two-tenths of one percent of the total contribution to PNV costs, variations in these unit costs would not be expected to have any impact on overall economic values arrived at in the Forest Plan. To make cost comparisons more useful for monitoring, the baseline costs were revised to correspond to that listed in Appendix 7 of the Forest Plan, rather than those erroneously used to calculate PNV. These new calculations are shown in this year's table. Since a higher baseline cost was used in Appendix 7, precommerical thinning costs are now comparable to the projected cost. In addition, the data shows that a downward trend was in place early in the plan period, and may be stabilizing at this time.

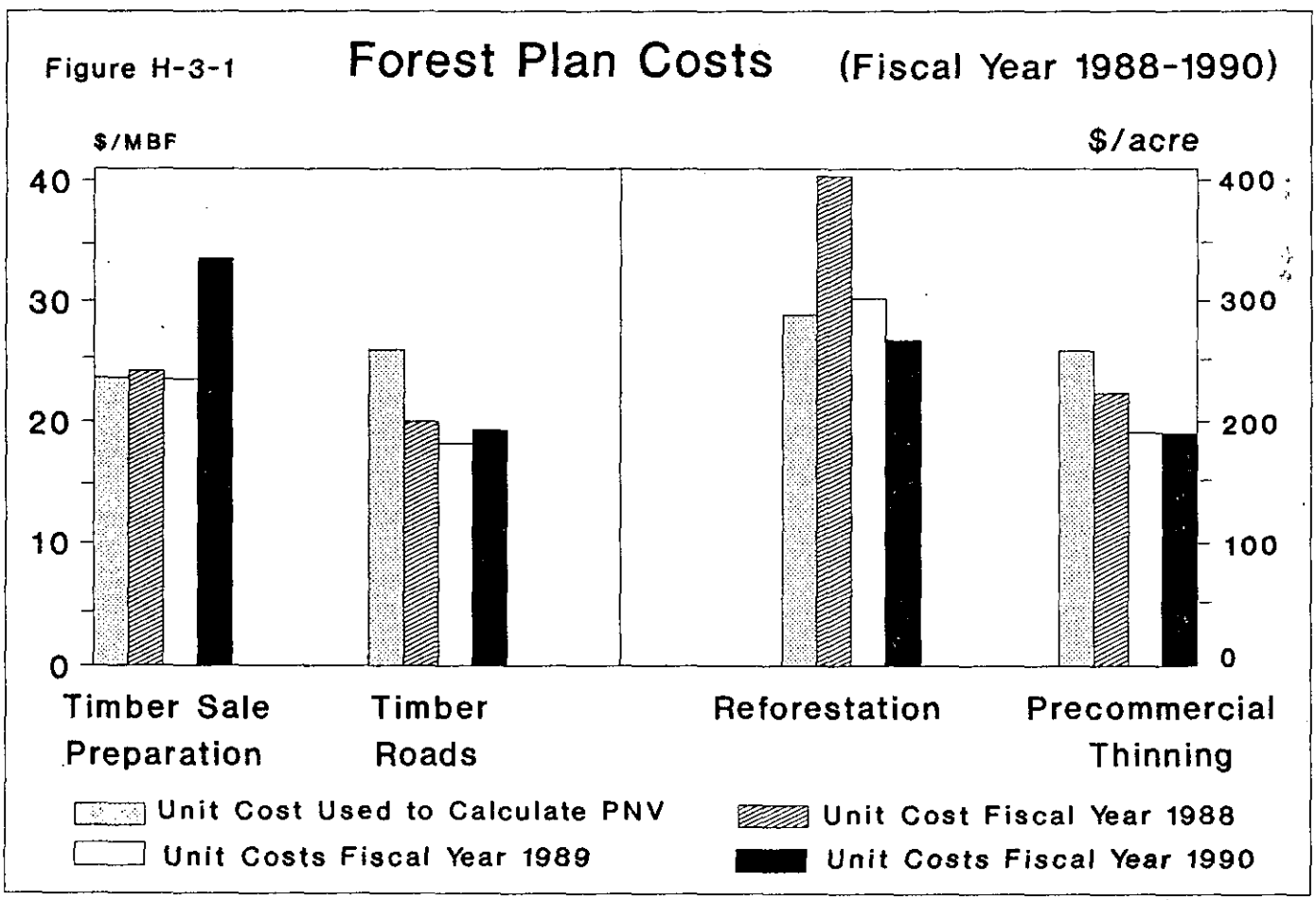
At this time, it appears that while some individual unit costs have changed more than 10%, overall the calculated PNV has remained as expected. Road costs are less than expected, but are likely to increase during the later part of the plan period. Reforestation costs were slightly high for one year, but with the variability involved, data are inconclusive at this time. Finally, revised precommercial thinning costs have decreased, and may be stabilizing. The Forest will continue to monitor costs in order to analyze trends and provide accurate data for use in the formal 5-year review period.

Table H-3-1 Forest Plan Costs

Cost Item	Units	Unit Cost used to Calculate PNV	Unit Costs Fiscal Year 1988	Unit Costs Fiscal Year 1989	Unit Costs Fiscal Year 1990
Timber Sale Preparation	$/MBF	23.60	24.22	23.51	33.50
Timber Roads	$/MBF	25.94	20.00	18.17	19.31
Reforestation	$/acre	288.22	403.97[1]	301.94	267.40
Precommer. Thinning[2]	$/acre	258.25	223.61	190.82	190.00

[1] This figure was revised from the last Monitoring report to provide consistency with the Forest's TSPIRS report. [2] Baseline figures as modified from the last monitoring report (see text).

Figure H-3-1 Forest Plan Costs (Fiscal Year 1988-1990)



Forest Plan Budget Levels: Monitoring Item H-4:

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

Background: The budget process is directly related to the Plan, but also influenced by other factors. Changes in programs implemented with the Plan could not be readily initiated because budgets for FY 88 and to an extent, FY 89, were already defined and submitted. 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.

Results: Table H-4-1-1 (next page) shows the planned budget, FY's 88-90 actual expenditures, and the percentage difference between them. When averaged over all three years, only the Knudson-Vandenburg and the Brush Disposal Funds stayed within the 10% level. Other budget items varied from 4 to 196 percent of planned.

Evaluation: In order to evaluate this information, the major Forest programs were considered. For these major items, all applicable budget items were grouped and added together. Other budget items, which reflect small, highly variable programs, can be more accurately evaluated when more years of data become available. Data for FY's 88-90 were then averaged to smooth out year-to-year variation. Output levels for each major resource area were obtained from Appendix A (in this report) and are based on the Forest's Management Attainment Report for fiscal years 1988-90. All outputs for the applicable budget items were included. To some extent, some misrepresentation was introduced by adding some outputs together (for instance, developed recreation and dispersed recreation) but overall results do show the major trends. Table H-4-2, on a following page, shows the results of this analysis. An evaluation of each budget area follows Table H-4-2.

Table H-4-1 Projected and Actual Budget Used to Implement the Forest Plan (in thousands of dollars, rounded -- taken from Forest Plan Appendix 7)

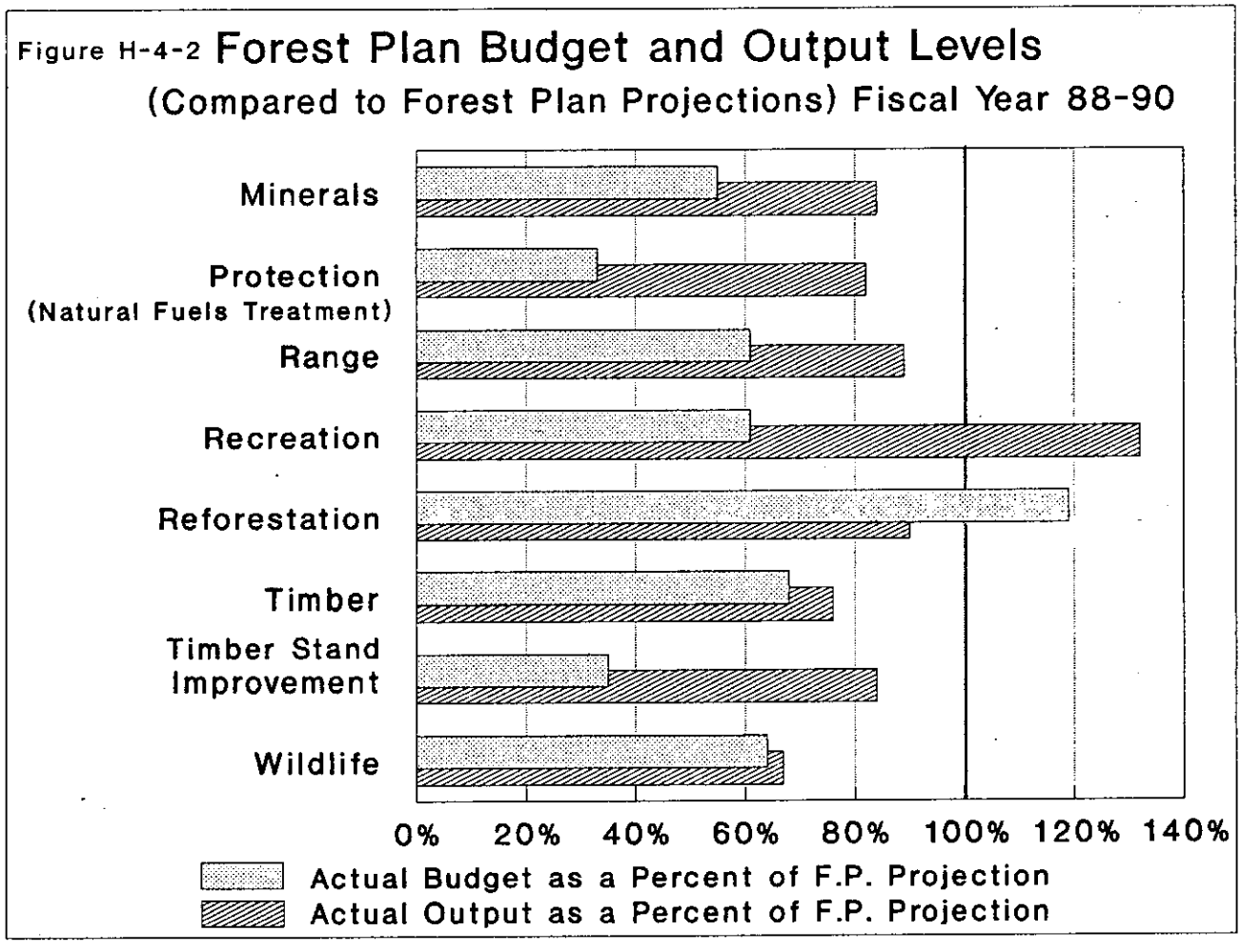
Fund-ing Item	Budget Activity	FY 78[1] Dollars	Planned FY 88[2] Dollars	Actual FY 88 Dollars	FY 88 % of Planned Dollars	Planned FY 89[3] Dollars	Actual FY 89 Dollars	FY 89 % of Planned Dollars	Planned FY 90[4] Dollars	Actual FY 90 Dollars	FY 90 % of Planned Dollars	Ave. of FY 88-90 % of Planned Dollars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

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

Table H-4-2 Forest Plan Budget & Output Levels

Activity or Outputs	Actual Budget as a Percent of Forest Plan Projection (FY's 88-90)	Actual Output as a Percent of Forest Plan Projection (FY's 88-90)
Minerals	55	84
Protection, Natural Fuels Treatment	33	82
Range	61	89
Recreation[1]	61	132
Reforestation	119	90
Timber	68	76
Timber Stand Improvement[2]	35	84
Wildlife	64	67

[1] Numbers reflect a correction of FY's 88-89 monitoring report.
[2] Numbers reflect comparison to Appendix 7 of the Forest Plan rather than the FORPLAN model as was used for the FY's 88-89 monitoring report.



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

Protection (natural fuels reduction): Budgets have been quite low in this area, and outputs have also lagged over Forest Plan amounts. Proportionately, however, targets have maintained closer to planned amounts. This results from the selection of lower-than-average-cost projects and deferral of higher-than-average-cost projects. As deferred projects resurface, it's expected that budget levels will need to increase to maintain attainment levels.

Range: Both range budgets and production amounts are below that shown in the Plan, but relatively less so for production. Several years may be necessary to determine if this apparent trend continues. It's expected that negative impacts on range conditions could occur if production levels stay relatively higher and budget levels remain low. Range quality is monitored as a part of regular program management.

Recreation: Compared to the Plan, recreation budgets are lower and outputs are 32% higher. The low level of this program results from budgetary processes in place prior to the issuance of the Forest Plan and continuing difficulty in obtaining full funding on a National basis. Outputs, however, are steadily increasing as more people opt for recreational activities on National Forests. In addition, increase in demand for recreation products should show steady increase through the 1990's.

Reforestation: Reforestation levels are slightly below those indicated in the plan, due to less than anticipated regeneration harvest acres. As seen for Monitoring item E-2 (Acres Sold for Harvest by Management Area) these types of cutting practices are not reaching Forest Plan levels. As a result, it's expected that reforestation work will not reach the Forest Plan levels in the near future. The amount spent through the first three years of the plan is higher than anticipated, even though accomplishment is not. *Unit costs are higher than anticipated (see section H-3), probably due to the accelerated harvest of* lodgepole pine stands to minimize the loss of wood products resulting from mountain pine beetle induced mortality. Often, these acres require tree planting for regeneration, and less expensive natural regeneration prescriptions are not viable. As the relative amount of lodgepole harvest declines later in the plan period, the cost of reforestation work is expected to decline relatively.

Timber: Both timber budgets and outputs are less than planned. Timber budgets are slightly lower than targets on a proportional basis, but indicate a strong direct relation. As discussed elsewhere in this report (see the introduction and summary), there are several reasons why planned amounts have not been achieved. Figures in this section reflect the same trends discussed elsewhere.

Precommercial Thinning: Actual costs for thinning for the first three years of the plan have been substantially less than those anticipated (see Appendix 7 of the Forest Plan). Acreage thinned has not fully reached planned levels, but due to normal variations in program activity, may approach planned amounts in future years as more stands grow into overstocked conditions or more stands become accessible.

Wildlife and Fish: *Cumulative budgets and output levels are continuing* to be low, but as can been seen in Table H-4-1, there is a strong trend in place reflecting a substantial increase in budgets. As can be seen, in FY 88 the Forest received 36% of the Forest Plan budget amount for Wildlife and Fish (funding item 10), while for FY 90, it received 54%. It is anticipated that this trend will continue, as local and national emphasis is changing to increase wildlife and fish programs. Also, continuing efforts such as the challenge cost share program are expected to add to both budget and output levels.

APPENDIX A

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

			PLANNED UNITS[1]	ACTUAL UNITS ACCOMPLISHED BY FISCAL YEAR (FY)				
TARGET ITEM	OUTPUT or ACTIVITY	UNIT of MEASURE	FISCAL YEARS 1988-92	FY 88	FY 89	FY 90	Average Units Per Year	Percent of Planned Units
RECREATION	Developed Use	M RVD	297	318	273	200	264	89
	Dispersed Use -							
	Wilderness	M RVD	18	35	17	30	27	152
	Non-wilderness	M RVD	559	797	900	866	854	153
WILDLIFE & FISH	Wildlife Habitat Improvement	M Acres	5.6	3.0	5.1	3.1	3.7	67
	T & E Habitat Improvement	Acres	150	405	0	0	135	90
	Fish Habitat Improvement	Acres	120	276	137	62	158	132
RANGE	Permitted Grazing Use	M AUM	12.6	11.6	10.3	11.7	11.2	89
SOIL	Soil Inventory	M Acres	15.7	1.0	1.0	20.0	7.3	47
LANDS	Land Exchange	M Acres	1.7	5.8	3.3	0.3	3.1	184
MINERALS	Minerals Management	Cases	300	220	312	226	253	84
PROTECTION	Fuels Treatment, Natural	Acres	800	621	583	798	667	83
TIMBER	Total Volume Offered	MMBF	233[2]	175	185	150	170	73
	Reforestation - Approp.	M Acres	7.0[3]	2.3	3.1	5.0	3.5	50
	Reforestation - KV	M Acres	7.1[3]	5.0	6.4	8.5	6.6	93
	Timber Stand Impr. - Approp.	M Acres	4.0[4]	3.4	4.0	3.0	3.5	87
	Timber Stand Impr. - KV	M Acres	1.0[4]	0.5	0.7	1.0	0.7	73
	Stand Examination	M Acres	139	171	208	197	192	138
	Fuel Treatment - BD/KV	M Acres	11.7	11.7	14.5	12.0	12.7	109
FACILITIES	Roads -							
	Arterial/Collector:							
	Construction	Miles	5	29	46	56	44	880
	Reconstruction	Miles	7[6]	62[5]	50[5]	90[5]	67[5]	957[5]
	Local:							
	Construction	Miles	232	65	61	55	60	26
	Reconstruction	Miles	46[6]	11[5]	20[5]	9[5]	13[5]	28[5]
	Total Road Construction	Miles	237	94	107	112	104	44
	Total Road Reconstr.	Miles	53	73	70	99	81	153
	Trail Construction/Reconstr.	Miles	7.5	6.0	6.0	1.0	4.3	58

[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] Includes Timber Purchaser obligations for natural regeneration site preparation.
[4] Includes precommercial thinning and release.
[5] Includes major reconstruction (15%) and minor reconstruction (85%).
[6] Includes only major reconstruction. It does not include resurfacing, reclearing, etc. which are also included in normal road reconstruction contracts.

APPENDIX B

Timber Sell Volume: Monitoring Item E-1

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

Table APP.-B-1

SUITABLE LANDS

	Forest Plan [1]	FY88	FY 89	FY 90	Total FY 88-90	Avg. Per Year	3-Year Volume Diff.	Percent Difference
Unit of Measure>>	MMBF	MMBF	MMBF	MMBF	MMBF	MMBF	MMBF	
ASQ:								
Regulated	202	152.4	152.8	115.4	420.6	140.2	-185.4	-30.6%
Non-interchangeable								
Dead LPP	20	19.2	25.9	26.4	71.5	23.8	11.5	19.2%
Other Dead	5	1.7	2.3	4.5	8.5	2.8	-6.5	-43.3%
Total Non-interchangeable	25	20.9	28.2	30.9	80.0	26.7	5.0	6.7%
Total ASQ	227	173.3	181.0	146.3	500.6	166.9	-180.4	-26.5%
Non-chargeable [2]								
Roundwood	0	0.9	0.7	0.8	2.4	0.8	N/A	N/A
Fuelwood	0	2.4	3.2	2.1	7.7	2.6	N/A	N/A
Total Non-chargeable	0	3.3	3.9	2.9	10.1	3.4	N/A	N/A

UNSUITABLE LANDS

All Unregulated	6	2.4	3.4	2.2	8.0	2.7	-10.0	-55.6%

[1] Average Annual Outputs

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

NOTE: Due to rounding, sums may not total exactly.

APPENDIX C

FOREST PLAN - CHAPTER IV, IMPLEMENTATION

A. Introduction

Implementation of the Kootenai National Forest Plan requires moving from an existing management program, with a budget and "targets" for accomplishment, to a new management program with a budget, goals, and objectives that provide a different way of addressing the issues and concerns people have voiced about Forest management. This Forest Plan establishes the direction for the Kootenai National Forest for the next 10 to 15 years, when used in conjunction with Forest Service Manuals and Handbooks and the Northern Region Guide.

The remainder of this chapter explains how management of the Kootenai National Forest moves from the Current Direction and Existing Situation to the Forest Plan, all described in the EIS. The following sections describe aspects of Implementation that are influenced by previous management activities and objectives; the relationship between project planning and this Forest Plan; the goals of, and requirements for monitoring and evaluation; and the circumstances which could require the plan to be amended or revised.

B. Influence of Past Management on Future Options

Chapter III defines management direction for specific areas of the Forest. In some instances, this direction represents a change from current management direction. Where no previous management activities have occurred, the prescriptions of this Forest Plan can be put into effect from a neutral point. However, in areas where management activities have occurred to meet objectives other than those now specified, a transition period may be required to bring management fully into line with this Plan.

In addition to specifying management direction for areas of the Forest, this Plan schedules management activities. In some situations, previous management activities influence the scheduling of future activities.

C. Project Planning

The Forest Plan serves as the single land management plan for the Kootenai National Forest. All other land management plans are replaced by the direction in this Forest Plan.

Similarly, this Forest Plan directs the management of all resources on the Kootenai National Forest. All previous resource management plans are replaced by this document. Resource management objectives are displayed in Chapter II, and schedules of resource management practices for each management area are displayed in Chapter III.

Several documents designed to give further guidance to management activities have been or will be developed "under the umbrella" of this Forest Plan. They are:

- Annual Forest Travel Plan
- Area Transportation Development Plans
- Landownership Adjustment Plan (Appendix 9)
- Cabinet Mountains Wilderness Action Plan
- Fire Management Action Plans

The management direction provided by this Forest Plan comprises the sideboards within which project planning and activities take place. It defines management area goals and management standards that guide project activities toward achieving a desired future condition for the management areas and, collectively, for the Forest. It specifies a schedule for project activities (management practices). It provides guidance

concerning potential land type and habitat type constraints, including assumptions about the appropriate vegetation management practices for timber sale projects. On-the-ground project analysis validates or invalidates the appropriateness of those assumptions.

Within this guidance, the projects are developed to most efficiently and effectively accomplish the management goals and objectives. All NEPA requirements will be complied with in all projects.

Project environmental analyses provide an essential source of information for Forest Plan monitoring. First, as project analyses are completed, new or emerging public issues or management concerns may be identified. Second, the management direction designed to facilitate achievement of the management area goals are validated by the project analyses. Third, the site specific data collected for project environmental analyses serve as a check on the correctness of the land designation. All of the information included in the project environmental analysis is used in the monitoring process to determine when changes should be made in the Forest Plan.

As part of project planning, site-specific water quality effects will be evaluated and control measures designed to ensure that the project will meet Forest water quality goals; projects that will not meet State water quality standards will be redesigned, rescheduled, or dropped.

If it is determined during project design that the best way to meet the management area goals of the Forest Plan conflicts with the Forest Plan standards, the Forest Supervisor may approve a variance to that standard for the project; such variances and the rationale for the changes must be described in the project's documentation and effected by means of a project specific amendment to the Forest Plan. There will be no deviation from standards established for threatened and endangered species conservation and protection unless a biological evaluation concludes that such a deviation would have no effect on the recovery of the species and there has been consultation with the Fish and Wildlife Service.

D. Monitoring and Evaluation

Monitoring and evaluation comprises the management control system for the Forest Plan. It will provide the decisionmaker and the public with information on the progress and results of implementing the Forest Plan.

Monitoring and evaluation entails comparing the end-results being achieved to those projected in the Plan. Outputs, and environmental effects, both experienced and projected, will be considered. In other words, are we doing what we said we were going to do and is what's happening what we expected to happen?

To do this, a comparison will be made, on a sample basis, of overall progress in implementing the Plan as well as whether the overall relationships on which the Plan is based have changed over time. When changes occur, they will be evaluated as to their significance, and appropriate amendments or revisions made if needed.

The goals for monitoring and evaluating this Forest Plan are to determine:

- How well the Forest is meeting its planned goals and objectives;

- If existing and emerging public issues and management concerns are being adequately addressed;

- How closely the Forest Plan's management standards are being followed;

- If outputs and services are being provided as projected;

- If the effects of implementing the Forest Plan are occurring as predicted, including significant changes in the productivity of the land;

- If the dollar and manpower costs of implementing the Forest Plan are as predicted;

- If implementing the Forest Plan is affecting the land, resources, and communities adjacent to or near the Forest;

- If activities on nearby lands managed by other Federal or other governmental agencies, or under the jurisdiction of local governments, is affecting management of the Forest;

- If research is needed to support the management of the Forest, beyond that identified in Chapter II of the Forest Plan; and

- If there is a need to amend or revise the Forest Plan.

The monitoring requirements for this Forest Plan are outlined in Table IV-1, Forest Plan Monitoring Requirements. These requirements address the items to be monitored, the data sources, expected precision and reliability, frequency of measurements, reporting period, and the acceptable variability. Most of the monitoring items are applicable to specific Management Areas; a listing of applicable monitoring items is included in the direction for each Management Area (Chapter III). Other monitoring items are more applicable to broad areas or are Forest-wide in nature and will be evaluated from such sources as the data base, Forest Attainment Reports, public involvement processes, and non-Forest-Service sources.

Evaluation of data gathered during monitoring will be guided by the Decision Flow Diagram detailed in Figure IV-2. As indicated in the diagram, the results of this evaluation lead to decisions on further action of the following types:

- continuing the management practice;

- referring the problem to the appropriate line officer for improvement of the application of the management practice;

- modifying the management prescription as a Plan amendment;

- modifying the land designation as a Plan amendment;

- revising the schedule of outputs;

- revising the cost/unit output; or

- initiating revision of the Plan.

The document resulting from the use of the Decision Flow Diagram constitutes the evaluation report. As applicable, the following will be included in each evaluation report;

- A quantitative estimate of performance comparing outputs and services with those projected by the Forest Plan;

- Documentation of measured effects, including any change in productivity of the land;

- Unit costs associated with carrying out the planned activities as compared with unit costs estimated during Forest Plan development;

- Recommendations for changes;

- A list of needs for continuing evaluation of management systems and for alternative methods of management;

- A list of additional research needed to support the management of the Forest; and

- Identification of additional monitoring needs to facilitate achievement of the monitoring goals.

E. Amendment and Revision

The Forest Supervisor may amend the Forest Plan. Based on an analysis of the objectives, standards, and other contents of the Forest Plan, the Forest Supervisor shall determine whether a proposed amendment would result in a significant change in the Plan. If the change resulting from the proposed amendment is determined to be significant, the Forest Supervisor shall follow the same procedure as that required for development and approval of a Forest Plan. If the change resulting from the amendment is determined not to be significant for the purposes of the planning process, the Forest Supervisor may implement the amendment following appropriate public notification and satisfactory completion of NEPA procedures.

A Forest Plan shall ordinarily be revised on a 10-year cycle or at least every 15 years. It also may be revised whenever the Forest Supervisor determines that conditions or demands in the area covered by the Plan have changed significantly or when changes in RPA policies, goals, or objectives would have a significant effect on Forest level programs. In the monitoring and evaluation process the interdisciplinary team may recommend a revision of the Forest Plan at any time. Revisions are not effective until considered and approved in accordance with the requirements for the development and approval of the Forest Plan. The Forest Supervisor shall review the conditions on the land covered by the plan at least every 5 years to determine whether conditions or demands of the public have changed significantly.

TABLE IV-1

MONITORING AND EVALUATION REQUIREMENTS

MONITORING ITEM MIH (1)	SUBJECT AND REG (2)	MONITORING OBJECTIVE	ACTIONS, EFFECTS, OR RESOURCES TO BE MEASURED	DATA SOURCE	EXPECTED PRECISION (3)	EXPECTED RELIABILITY (4)	FREQUENCY MEASUREMENT (5)	REPORTING PERIOD (6)	VARIABILITY WHICH WILL INITIATE FURTHER ACTION
A - 1	RECREATION 36 CFR 219 .12 (K) (1)	Measure trends in roadless area use	Dispersed use in wilderness or non wilderness areas	1. RIM data 2. Interviews	Moderate	Low	Sample four times a year; once in each season	5 years	+/- 20% from the predicted trends of RVD's by type of use (motorized or roadless)
A - 2	RECREATION 36 CFR 219 .12 (K) (2)	Determine whether areas are being overused	Site conditions in roadless and semi-primitive motorized recreation areas and trails	LAC/Code-a-site (Or similar form), and photos	Moderate	Moderate	Biannual	5 years	Site deterioration sufficient to damage soil & water resource, permanently affect the sites' ability to recover, become a safety hazard, or detract from the recreation experience
A - 3	RECREATION 36 CFR 219 .12 (K) (1)	Measure the effectiveness of visual resource management program	VQO acres where treatment meet objectives	Project EA's	Moderate	Moderate	Annual	5 years	Over 10% of acres do not meet VQO category
A - 4	RECREATION 36 CFR 219 .12 (K) (1)	Measure trends in Developed site use	Developed recreation	1. Occupancy data kept by Hosts 2. Fee collection data 3. Spot checks of sites	High	High	Annual	5 years	+ 20% from predicted RVD's

(1) Management Information Handbook code letter.
(2) General subject area and NFMA regulation.
(3) The exactness or accuracy with which the data will be collected.
(4) The degree that monitoring can be expected to reflect the total Forest and reporting situation.
(5) Sampling frequency and sample size where appropriate.
(6) Period for which data is collected prior to analysis

MONITORING ITEM MIH (1)	SUBJECT AND REG (2)	MONITORING OBJECTIVE	ACTIONS, EFFECTS, OR RESOURCES TO BE MEASURED	DATA SOURCE	EXPECTED PRECISION (3)	EXPECTED RELIABILITY (4)	FREQUENCY MEASURE-MENT (5)	REPORTING PERIOD (6)	VARIABILITY WHICH WILL INITIATE FURTHER ACTION
A - 5	RECREATION 36 CFR 219 .12 (K) (2)	Affects of ORV use	1. Environmental effects of ORV use to: a. soil & water b.wildlife 2. Amount of ORV use 3. Conflict, if any, with other users.	1. Observation 2. Interviews 3. Surveys	Moderate	Low	Annual	5 years	Same as A-2
A - 6	RECREATION 36 CFR 219 .12 (K) (1)	Acres and distribution of the roadless resource.	1. Location of activities. (usually timber sales).	1. Project EA 2. District staff.	High	High	Annual	5 years	1. +/- 5% of acres 2. +/- 5% distribution by district.
A - 7	ARCHEOLOGY 26 CFR 219 .12 (K) (1) AND 36 CFR 800	Monitor compliance with 36 CFR 800	Management impacts on cultural resources	1 Surveys/ inventories 2. Nomination 1. Enhancement 4. Evaluation 5. Site stabilization 6. Performance standards	High	High	Annual	5 years	More than 10% variability from standards
C - 1	WILDLIFE 36 CFR 219 .12 (K) (1)	Maintain habitat capable of supporting 68% of max potential elk population: 5500 End Dec 1 6550 End Dec 2 8000 End Dec 3	Elk habitat capability as % of potential	1. Stand Exams 2. Annual travel plan 3. Elk habitat guidelines 4. Project EA's 5. Habitat transects for sample projects	Moderate	Moderate	Annual	5 Years	Any Downward Trend.
C - 2	WILDLIFE 36 CFR 219 .12 (K) (1)	Maintain the trend of achieving 8000 elk after 30 years	Numbers of elk as a big game indicator	1. Habitat transects 2. MDFW&P census and harvest results	Moderate	Low	Annual	5 Years	Any Downward Trend

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MONITORING ITEM MIH (1)	SUBJECT AND REG (2)	MONITORING OBJECTIVE	ACTIONS, EFFECTS, OR RESOURCES TO BE MEASURED	DATA SOURCE	EXPECTED PRECISION (3)	EXPECTED RELIABILITY (4)	FREQUENCY MEASURE-MENT (5)	REPORTING PERIOD (6)	VARIABILITY WHICH WILL INITIATE FURTHER ACTION
C - 3	WILDLIFE	Provide habitat capable of maintaining or enhancing other big game populations	Habitat capability for big game other than elk (bighorn sheep, mtn goat, moose, whitetail deer, black bear, and mtn lion)	1. Project EA's 2. MDFW&P reports, surveys, & harvest results 3. Personal observations	Moderate	Low	Annual	5 Years	Downward population trend, or noticeable decrease in habitat capability
C - 4	WILDLIFE 36 CFR 219 .12 (K) (1)	Maintain viable population of old growth depemdemt species (>/- 40% of potential	Population levels of old growth dependent species	1. Population transects 2. Personal observations	Moderate	Low	Annual	5 years	Any reduction approaching minimum viable population levels (40% of potential population)
C - 5	WILDLIFE 36 CFR 219 .12 (K) (2)	Maintain habitat capable of supporting viable populations of old growth dependent species (10% old gdrowth in each drainage)	Old growth habitat amount and condition	1. Timber stand data base 2. Old growth data base 3. Spot surveys 4. Project EA's	High	Moderate	Annual	2 Years	Reduction below 10% in a drainage which was previously over *minimum*; or any reduction in a drainage previously under *minimum*
C - 6	WILDLIFE 36 CFR 219 .12 (K) (2)	Maintain habitat capable of supporting viable populations of cavity nestors (>/- 40% of potential)	Cavity habitat condition and amount	1. Stand exams 2. Spot surveys 3. EA's for a sample of projects	Moderate	Moderate	Annual	5 Years	Any reduction in habitat capability *approaching* 40% of potential

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MONITORING ITEM MIH (1)	SUBJECT AND REG (2)	MONITORING OBJECTIVE	ACTIONS, EFFECTS, OR RESOURCES TO BE MEASURED	DATA SOURCE	EXPECTED PRECISION (3)	EXPECTED RELIABILITY (4)	FREQUENCY MEASURE-MENT (5)	REPORTING PERIOD (6)	VARIABILITY WHICH WILL INITIATE. FURTHER ACTION
C - 7	WILDLIFE 36 CFR 219 .12 (K) (2)	Provide habitat capable of supporting recovered populations of T&E species, and cooperate in recovery operations	Kootenai N.F. contribution to T&E species recovery (grizzly bear, bald eagle, and gray wolf)	1.Habitat maps 2. Cumulative effects analysis 3. Habitat improvement accomplishment reports 4. Recovery plans 5. Poplulation and habitat research	High	Moderate	Annual	Annual	Any downward population trend. Any forest wide decrease in habitat quantity or quality. Failure to meet Kootenai N.F. recovery plan goals
C - 8	WILDLIFE 36 CFR 219 .12 (K) (1)	Maintain indicator species above minimum viable populations levels for the Forest as a whole (see Appendix 12)	Habitat for indicator species & population trends	1. Spot surveys 2. Stand exams 3. Timber stand data base	Moderate	Moderate	Annual	5 years	Any reduction approaching minimum habitat needed for viable population levels (40% of potential populations)
C - 9	RIPARIAN 36 CFR 219 .12 (K) (1)	Insure that the intent of riparian management goals are metT	Riparian habitat condidtion	1. Mapping from project EA's 2. Informadtion gathered from; M&E Items C-10, F-1, & F-2	High	High	Annual	5 years	Variability limits listed in M&E Items C-10, F-1, And F-2

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(2) General subject area and NFMA regulation.
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MONITORING ITEM MIH (1)	SUBJECT AND REG (2)	MONITORING OBJECTIVE	ACTIONS, EFFECTS, OR RESOURCES TO BE MEASURED	DATA SOURCE	EXPECTED PRECISION (3)	EXPECTED RELIABILITY (4)	FREQUENCY MEASUREMENT (5)	REPORTING PERIOD (6)	VARIABILITY WHICH WILL INITIATE FURTHER ACTION
C - 10	FISHERIES 36 CFR 219 .12 (K) (1)	To assure changes in fish habitat and numbers do not exceed those predicted	Fish habitat and spawning habitat (on the following representative streams in conjunction with M&E Items F-1, & F-2: Bristow Crk MA 15 Sunday Crk MA 12, 13 Red Top Crk MA 12, 13 Rock Crk MA 2 Granite Crk MA 2, 8 Flower Crk MA 8 Big Crk MA 3	1. Stream surveys 2. Core samples 3. Stream temperature samples 4. Debris recruitment analysis 5. Redd counts 6. Enbeddedness samples	High	Moderate	Annual	2 years	+/- 10% change in Redd #'s +/_ 2 degrees stream temp from normal +/- 10% change in sediment +/- 10% change in embeddness +/- 20% change in debris accumulation
D - 1	RANGE	To see if Plan objectives are being met	AUM's permitted	1. Range allotment permits 2. FRAMIS reports 3. Allotment plans 4. Spot checks	High	High	Annual	Annual	+/- 20% of anticipated AUM's
D - 2	RANGE 36 CFR 219 .12 (k) (2))	To indentify changes in noxious weed infestations	Acres infested with noxious weeds	1. Spot surveys 2. Publilc inplut 3. County survey data	Moderate	High	Annual	Annual	10% increase in number of acres infested; 10% increase in density of existing infestations. A change in the diversity of noxious weed species
E - 1	TIMBER 36 CFR 219 .12 (K) (1)	To see if Plan objectives are being met	Regulated and unregulated sell volume	1. Cut and sold report 2. Chief's report	High	High	Quarterly	Annual	+/- 5% deviation after 5 years (Regulated Vol) 10% deviation afdter 5 years (unregulated Vol)

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MONITORING ITEM MIH (1)	SUBJECT AND REG (2)	MONITORING OBJECTIVE	ACTIONS, EFFECTS, OR RESOURCES TO BE MEASURED	DATA SOURCE	EXPECTED PRECISION (3)	EXPECTED RELIABILITY (4)	FREQUENCY MEASURE-MENT (5)	REPORTING PERIOD (6)	VARIABILITY WHICH WILL INITIATE FURTHER ACTION
E - 2	TIMBER 36 CFR 219 .12 (K) (1)	To see if Plan objectives are being met	Acres harvested by Management Area	Timber stand data base	High	High	Annual	Annual	10% by MA after 5 years
E - 3	TIMBER 36 CFR 219 .12 (K) (5ii)	To track ground varification of MA boundaries	Documented adjustments to MA boundaries	EA's for timber sales	High	High	Annual	Annual	+/- 5000 acre cumulative total change in any MA with programmed timber harvest after 5 years
E - 4	TIMBER 36 CFR 219 .12 (K) (1)	To validate Plan yield tables	Growth trends by productivity class (MIXCON I, MIXCON II and LPP)	1. Timber stand data base 2. Permanent growth plots 3. Stand exams for thinning	High	Moderate	Annual	5 years	+/- 10% of predicted volume by productivity class
E - 5	TIMBER 36 CFR 219 .12 (K) (5i)	To track Plan targets and to insure NFMA requirements are met	Acres of reforestation and survival	Timber stand data base	High	High	Annual	5 years	+/- 10% deviation from predicted regeneation acres 10% of stands are not certified regenerated within 5 years of regeneration
E - 6	TIMBER 36 CFR 219 .12 (K) (2)	To see if Plan targets are being met	Acres of timber stand improvement	Timber stand data base	High	High	Annual	5 years	+/- 20% of predicted acres accomplished

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MONITORING ITEM MIH (1)	SUBJECT AND REG (2)	MONITORING OBJECTIVE	ACTIONS, EFFECTS, OR RESOURCES TO BE MEASURED	DATA SOURCE	EXPECTED PRECISION (3)	EXPECTED RELIABILITY (4)	FREQUENCY MEASURE-MENT (5)	REPORTING PERIOD (6)	VARIABILITY WHICH WILL INITIATE FURTHER ACTION
E - 7	TIMBER 36 CFR 219 .12 (K) (2) .12 (K) (3)	To track acres with programmed harvest where entry has been deferred because of economics or other resource conflicts such as Water Quality, Grizzly Bear, Mining, etc	Programmed harvest acres deferred from entry because of economics or other resource conflicts by MA	Project EA's	Moderate	Moderate	Annual	Annual	>10,000 acres cummulative change by MA after 5 years
E - 8	TIMBER 36 CFR 219 .12 (K) (5iii)	Evaluation of Maximum size limits for harvest areas	1. Cutting unit size by forest type, MA, & District	Project EA's	High	High	Annual	2 years	Variation in trends of other resources beyond the natural variation that can be determined.
F - 1	SOIL & WATER 36 CFR 219 .12 (K) (1) .12 (K) (2) .7(f)	To determine if Regional and project Soil & Water Conservation Practices are adequate to meet State Standards	1. Turbidity 2. Stream temperature 3. Total suspended solids 4. Streamflow	One sale/ District/year, or 5% to 10% of Forest sales	High	High	Quarterly	Annual	Failure to meet State standards
F - 2	SOIL & WATER 36 CFR 219 .12 (K) (1) .7(f)	Sediment impacts on fishery habitat	1. Bedload movement 2. Suspended solids 3. Streamflow	Monitoring of the 7 sample streams listed in M&E Item C-10	Moderate	Moderate	Annual	Annual	20% increase in bedload and suspended solids

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MONITORING ITEM MIH (1)	SUBJECT AND REG (2)	MONITORING OBJECTIVE	ACTIONS, EFFECTS, OR RESOURCES TO BE MEASURED	DATA SOURCE	EXPECTED PRECISION (3)	EXPECTED RELIABILITY (4)	FREQUENCY MEASURE-MENT (5)	REPORTING PERIOD (6)	VARIABILITY WHICH WILL INITIATE FURTHER ACTION
F - 3	SOIL & WATER 36 CFR 219 .12 (K) (2) .7(f)	To determine the cumulative level of water yield increases and the reslul-tant affect on stream channels	Water yield	1. Recoding guages 2. Crest guages 3. Channel surveys 4. Kootenai Water Yield Analysis Proce-dure	High	Moderate	Annual	Annual	20% increase in channel stability rating 20% of watersheds ex-ceed hydrologic guidelines
F - 4	SOIL & WATER 36 CFR 219 .12 (K) (2)	To determine changes in site quality (espe-cially on soils with a loess surface)	Soil compaction; surface displacement; and site quality	Transects in sample harvest units on one sale/District/year	Moderate	Moderate	Annual	5 years	15% decrease in site productivity
G - 1	MINERALS 36 CFR 219 .12 (K) (2) .7(f)	To monitor the effects of mineral activity on other resource suit-abilities	Acres of MA changed because of mineral activity	1. EA's 2. Mineral Oper-ating Plan 3. Lease applica-tions	High	High	Annual	5 years	>10,000 acres cumulative change in any MA after 5 years
H - 1	HUMAN AND COMMUNITY DEVELOP-MENT, EM-PLOYMENT, AND BUDGET 36 CFR 219 .7 (F) .12 (K)(1)	To determine the effect of Plan implemen-tation on the local economy	Change in local economy	1. Chamber of Commerce sur-veys 2. Industry re-ports 3. Employment statistics 4. 25% fund distribution 5. Census data	Moderate	Low	Annual	5 years	Further action will depend on the significance of Forest activi-ties and will most likely be reflected in changes after the first planning period (10 to 15 years)

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MONITORING ITEM MIH (1)	SUBJECT AND REG (2)	MONITORING OBJECTIVE	ACTIONS, EFFECTS, OR RESOURCES TO BE MEASURED	DATA SOURCE	EXPECTED PRECISION (3)	EXPECTED RELIABILITY (4)	FREQUENCY MEASURE-MENT (5)	REPORTING PERIOD (6)	VARIABILITY WHICH WILL INITIATE FURTHER ACTION
H - 2	HUMAN AND COMMUNITY DEVELOP-MENT, EM-PLOYMENT, AND BUDGET 36 CFR 219 .7(f)	To determine if there are local or Forest wide issues that were not considered in the Forest Plan, and if data is sufficient to assess the new issues	Emerging issues	1. Inform and involve efforts 2. EA responses	Moderate	Moderate	Annual	Annual	Issues surfaced that were not included in, or analyzed for affect by the Plan
H - 3	HUMAN AND COMMUNITY DEVELOP-MENT, EM-PLOYMENT, AND BUDGET 36 CFR 219 .12 (K) (3)	To determine if the costs of producing outputs that were used in the Plan continue to be valid	Cost of producing outputs	1. MAR's 2. MAT reports	High	Moderate	Annual	Annual	+/- 10% deviation from the cost data used to calculate PNV in this Plan
H - 4	HUMAN AND COMMUNITY DEVELOP-MENT, EM-PLOYMENT, AND BUDGET 36 CFR 219 .7 (f)	To determine the effect of deviations in budget levels	Budget levels and their effects on Plan implementation	Final Budget Advice	High	High	Annual	Annual	+/- 10% deviation, by funding item, from the predicted levels in this Plan
L - 1	FACILITIES 36 CFR 219 .12 (K) (1)	To determine if the road closure objectives of this Plan are being met	Miles of road closed	1. Transportation Information System (TIS) 2. Annual travel plan 3. Spot checks	High	High	Annual	5 years	+/- 20% of the proportion of open to closed roads, as described in this plan, by the end of the first decade

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(2) General subject area and NFMA regulation.
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MONITORING ITEM MIH (1)	SUBJECT AND REG (2)	MONITORING OBJECTIVE	ACTIONS, EFFECTS, OR RESOURCES TO BE MEASURED	DATA SOURCE	EXPECTED PRECISION (3)	EXPECTED RELIABILITY (4)	FREQUENCY MEASURE-MENT (5)	REPORTING PERIOD (6)	VARIABILITY WHICH WILL INITIATE FURTHER ACTION
L - 2	FACILITIES 36 CFR 219 .12.(K) (1)	To determine if road densities predicted in this Plan continue to be valid	Road density	EA's	High	High	Annual	5 years	Any increase in road density over that predict-ed in this Plan
P - 1	PROTECTION 36 CFR 219 .12 (K) (5iv)	Determine level of insect and disease organ-isms following mgmt. activities	Health of residual stand and surronding stands	Stand exam and annual aerial detection sur-veys	Moderate	Moderate	Annual	2 years	Insect and dis-ease levels in-crease beyond Yormal levels

(1) Management Information Handbook code letter.
(2) General subject area and NFMA regulation.
(3) The exactness or accuracy with which the data will be collected.
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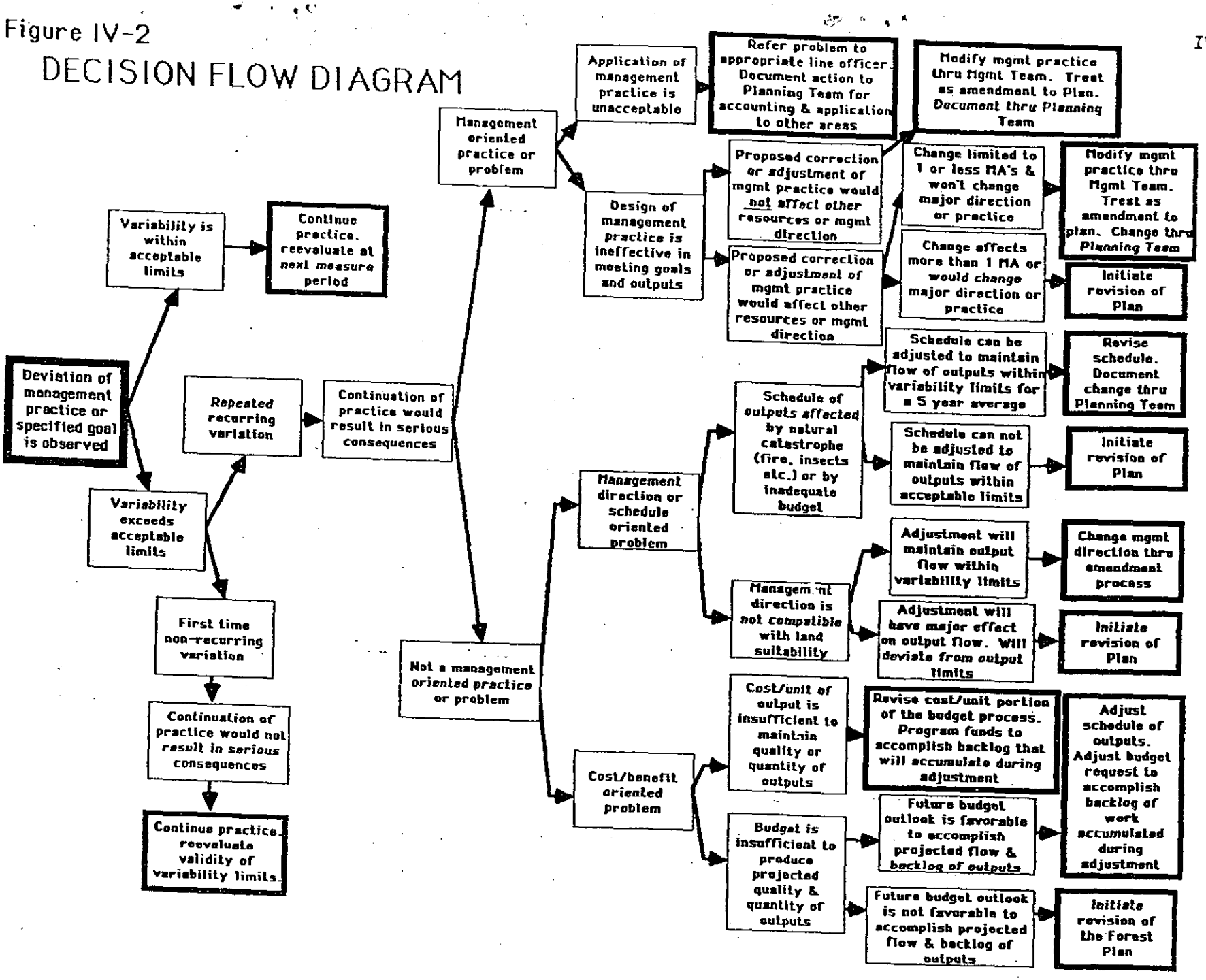
Figure IV-2

DECISION FLOW DIAGRAM



APPENDIX D

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
406-293-7741

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