



Planned and Actual Impacts on Fish and Water Quality in Three National Forests in Northern Idaho

Property of U.S. Environmental
Protection Agency Library MD-108

JUL 29 1988



PLANNED AND ACTUAL IMPACTS
ON FISH AND WATER QUALITY ON
THREE NATIONAL FORESTS IN NORTHERN IDAHO

Submitted by
Christine M. Kelly

Prepared for the-
United States Environmental Protection Agency
National Network for Water Policy Research and Analysis
Pilot Project

NOVEMBER, 1987



ABSTRACT

Much land within the State of Idaho is reserved as National Forests. The major type of water pollution from these reserves is nonpoint source, primarily sediment. Before silvicultural activities take place on the National Forest lands, they undergo extensive planning, in part to mitigate their impacts to water resources.

After detailing the planning process, this study examines three particular silvicultural operations on National Forests in northern Idaho. A comparison of planning and implementation of these operations assesses whether practices were carried out as planned and whether impacts were mitigated as predicted. The study then discusses problems with the process. Lack of monitoring and evaluation of forest operations was found to be the greatest problem. This lack of follow-up data limited assessment of agreement between planned and implemented practices and between predicted and actual impacts. According to the limited information that was available, practices overall seem to be carried out as planned and actual impacts on fish and water quality are fairly accurately predicted. However, before one can properly assess this agreement, more specific information must be included in environmental analyses and much more documented monitoring of implemented activities must be conducted. The study concludes with recommendations for further research.

Acknowledgments

I wish to express my appreciation to all those at the Environmental Protection Agency who made this study possible --- all those who developed the National Network for Water Policy Research and Analysis Pilot Program, who acquired the funding for this study, and who aided me in defining this study. I also wish to thank the many United States Forest Service personnel who spent hours explaining project operations and directing me to further information. A special thanks to D.B. and Brendan Marshall for all their encouragement and patience. And finally, thanks to the fish.

TABLE OF CONTENTS

| | |
|--|-----|
| Abstract..... | i |
| Acknowledgments..... | ii |
| Table of Contents..... | iii |
| Introduction..... | 1 |
| Summary of Observations..... | 4 |
| Planning Procedure for Forest Activities..... | 13 |
| General Planning..... | 13 |
| Specific Planning..... | 16 |
| Constraints for Preservation of Water Quality..... | 22 |
| Case Studies..... | 26 |
| Forest Background..... | 26 |
| Specific Studies..... | 29 |
| East Bruin Timber Sale..... | 32 |
| Lower Salmon Road..... | 43 |
| Simmons/Butte Road..... | 57 |
| Agreement Throughout the Process..... | 62 |
| EA Compliance with Forest-wide Plans..... | 63 |
| Contract Agreement with EA..... | 65 |
| Implementation Agreement with Pre-Contract Planning..... | 67 |
| Implementation Agreement with Contract..... | 69 |
| Problems With the General Process..... | 70 |
| Specificity of Environmental Assessments..... | 70 |
| Problems With Planning/Implementation/Monitoring..... | 76 |
| A) Planning..... | 76 |
| B) Implementation..... | 77 |
| C) Monitoring..... | 78 |
| Further Research..... | 82 |
| References..... | 83 |

INTRODUCTION

During the 1985 public comment period following the release of several proposed plans for National Forests in Idaho, several government agencies and citizens' organizations expressed concern over the lack of specificity contained in the plans with respect to fish and water quality impacts. The United States Forest Service (USFS) responded that the forest-wide plans by their nature had to be fairly general and that site-specific measures are addressed in the Environmental Assessments (EAs) prepared for each particular operation. With this in mind, the United States Environmental Protection Agency (EPA) funded this study of operations on National Forest lands in Idaho under its National Network for Water Policy Research and Analysis Pilot Study.

The primary objective of this study was to assess if actual impacts to fish and water quality were as predicted and if implemented practices for mitigation of impacts agreed with planned practices. Actual monitoring of impacts was beyond the scope of this preliminary study. Rather, USFS planning documents and follow-up evaluations were relied on to assess this agreement throughout the planning-implementation process. As time permitted, interviews were conducted with those familiar with the operations for their views on the conformity between planned and implemented practices and on the overall adequacy of mitigation measures.

As will be shown, the timing of this project is somewhat premature to meet this objective. Operations planned recently

enough to come under the present national planning directives have generally been insufficiently implemented to assess agreement. However, this prematurity difficulty aside, the greatest hindrance to this study was the lack of past monitoring and evaluation of project implementation.

Since EPA's concern was with protection and enhancement of water quality, water quality measures are the focus of this report. Most water quality impacts from silvicultural activities are due to nonpoint sources (NPS) of pollution, primarily sediment. Therefore, although some other water quality issues are presented by the case studies, they are given only minimal attention in this report. In Idaho, water quality standards are based on designated uses of water bodies. Most waters on National Forest lands are designated for coldwater biota or salmonid spawning, each requiring high water quality standards. Because of these designations, this report contains extensive discussion of the fisheries resources in the project areas.

This report first sets forth the general planning procedure for forest-wide plans and specific operations. A discussion of water quality regulations follows. The bulk of the report is a presentation of three case studies. It is hoped this presentation will familiarize the reader with the typical procedure involved in planning timber harvests and road constructions, the evolving nature of the planning process, the complexities involved in putting together these activities, the variety of adjustments included to resolve resource conflicts,

and the degree of planning flexibility between forests. The case studies are followed by an evaluation of agreement between planning and implementation, a discussion of issues raised concerning this process, and suggestions for further research.

SUMMARY OF OBSERVATIONS

I. PLANNING PROCEDURE FOR SPECIFIC ACTIVITIES.

1) Both the planning procedure and the technical parameters included in forest planning documents change with time. What is considered to be important when the projects are implemented may not have been important during the planning phases.

2) The decision to conduct an environmental analysis on a proposed project seems to include the decision to go ahead with development.

3) After an Environmental Assessment is prepared, the responsible line officer almost always files a Finding of No Significant Impact instead of deciding to prepare an Environmental Impact Statement.

4) The planning procedure for specific timber sales and road constructions may take up to ten years to complete.

II. CASE STUDIES.

A) East Bruin Timber Sale, Idaho Panhandle National Forests.

1) Of the three forests considered in this study, the Panhandle is doing the least amount of interdisciplinary or multi-disciplinary follow-up monitoring.

2) Other than use of project inspectors and timber sale

administrators, the only routine evaluation on the Panhandle is one administrative inspection per district per year. This inspection basically serves to educate timber sale administrators and obtain uniformity of administration between districts.

3) The Idaho Panhandle National Forests did not begin tying its specific project planning to NEMA policy and guidelines until the proposed forest plan was released in 1985.

4) The East Bruin EA included only one of the forest biologists' recommendations for mitigating impacts to fish and water quality, and this recommendation was justified in terms of allowing increased harvesting in the future.

5) The other recommendations of the biologists were not included in any planning documents in the East Bruin file.

6) During implementation, timber sale administrators contacted forest specialists when a serious soil erosion problem was encountered.

7) Evaluation of erosion control and water quality protection was not included in the standard checklist for contract closure.

B) Lower Salmon Road Construction, Clearwater National Forest.

1) During the early planning stages for the Lower Salmon project, numerous comments from forest personnel reflected concern over unstable soils in the project area.

2) The Lower Salmon EA was the most specific of the three

EAs studied, both in terms of describing the present status of the project area and in terms of presenting general mitigating measures.

3) In the Lower Salmon EA, the risk of watershed degradation from all of the development alternatives was considered to be high.

4) The Forest Supervisor's Finding of No Significant Impact (FONSI) was based in part on no expected degradation of watershed stability.

5) The use of an EA and FONSI for this project appears to have been inadequate to meet NEPA requirements. A full EIS should have been prepared.

6) The Lower Salmon project raises the question of compliance with the statutory intent of NFMA, since NFMA prohibits harvesting where watershed conditions will be irreversibly damaged.

7) The EA's 15-year recovery period for the streams was considered to be inadequate by the forest fisheries biologist. He suggested a 30-year stream recovery period was more accurate.

8) This was the only operation considered in this study that had water- or fish-related comments from non-USFS organizations.

9) This was the only EA considered in this study that included monitoring requirements.

10) Inspections by an interdisciplinary team were conducted during road construction, and reports on at least some of these inspections were filed.

C. Simmons/Butte Road Construction, Nezperce National Forest.

1) The interdisciplinary team preparing the Simmons/Butte EA intended to consider sediment production and impacts on fish as limiting the degree of development rather than merely as consequences of development.

2) This project was postponed because of concerns voiced by environmentalists.

III. AGREEMENT THROUGHOUT THE PROCESS.

A. Agreement Between EA and Forest-wide Plan.

1) The Lower Salmon EA was the only one of the three studied that was sufficiently tied to the forest plan to allow comparison.

2) Many standards in the Clearwater National Forest Plan were reflected in the Lower Salmon EA.

3) The high fishable standard contained in the Lower Salmon EA and the Clearwater Forest Plan seems to preclude any present activity in the area, since sediment levels already exceed the allowable increase and, apparently, will continue to do so for more than the allowable duration.

B) Agreement Between Contract and EA.

1) The EA does not appear to be intended to direct specific practices during implementation. Rather, it seems to serve the function of identifying broad issues, identification of which automatically triggers inclusion of standard contract language.

2) The contract is the document that contains specific practices to be used during implementation.

3) Since the interdisciplinary team does not prepare the contract, the general measures in the EA do not always get translated into specific practices at all necessary sites.

C) Agreement Between Implementation and Pre-Contract Planning.

1) Documented monitoring of implementation is inadequate to thoroughly assess agreement between implementation and pre-contract planning materials.

2) What documented monitoring and evaluation is available suggests fairly thorough agreement between implementation and the EA.

3) Several recommendations of biologists were not implemented.

D) Agreement Between Implementation and Contract.

1) Documented monitoring of implementation is inadequate to thoroughly assess agreement between implementation and the contract.

2) What documented monitoring and evaluation is available suggests fairly thorough agreement between implementation and the contract with respect to fish and water quality measures.

IV. PROBLEMS WITH THE GENERAL PROCESS.

A) Specificity of EAs.

1) EAs are frequently not specific enough for publics to comprehend proposed activities, mitigation measures, and predicted impacts.

2) For the East Bruin and Simmons/Butte projects, the EAs were not more specific than the forest-wide plans with respect to standards and mitigation measures to protect fish and water quality.

3) Many measures contained in the EAs are rather vague and leave much room for interpretation. "Escape clauses" (such as minimize ditches, reduce hazard to acceptable levels, and maintain favorable flows) do not really require any level of compliance.

4) EAs do not contain very specific forest practices for mitigating anticipated impacts, nor very specific descriptions of proposed activities and their impacts on the environment.

5) The contract is the document that contains the specific forest practices that are to be followed during a particular activity. The design maps accompanying the contract contain the specific sites for activities.

6) Unlike the EA, the contract is not subject to public review prior to adoption.

7) The fact that publics cannot obtain from these site-specific EAs sufficient information to adequately assess the proposed action raises significant legal issues on the compliance of this process with NEPA.

B) Planning.

1) Because of the lack of baseline data, fish and water quality will likely continue to receive low priority during planning. For example, the proposed plan for the Idaho Panhandle National Forests had set 1994 as the target date for accomplishment of fish habitat surveys, spawning site analyses, and lake surveys. The final plan eliminated target dates altogether, requiring accomplishment, instead, as budgets allow.

2) The fisheries biologists for all three forests indicated that multiple resources personnel are adequately involved during planning, but these personnel do not have enough time for

monitoring and evaluation.

B) Implementation.

1) Concern was expressed by both USFS personnel and outside organizations that extensive multiple resource planning is for naught when activities are inspected only by engineers or foresters.

2) Several USFS personnel indicated that districts vary in their priorities during implementation: some districts are not as concerned with fish and water quality as others. The same variation in implementation has often been raised by outside organizations with respect to the different forests.

C) Monitoring.

1) The greatest problem with the process is lack of documented monitoring.

2) Even if inspectors and administrators do not consciously have a pro-timber bias in their resolution of conflicts, the fact remains that these personnel are trained foresters, forest technicians, or engineers, not aquatic biologists or hydrologists.

3) There is very little documented evaluation of how well operations have been conducted.

4) In some cases, there has even been very little

observation of how well operations have been conducted.

5) Some forest supervisors and regional administrators are resisting monitoring to the degree desired by some USFS personnel and outside agencies.

V. RECOMMENDATIONS.

1) To improve the degree of specificity in EAs, it may be necessary to make standards and guidelines in the forest-wide plans specific enough to be directly incorporated into the EAs. This seems to be particularly crucial for monitoring and evaluation requirements.

2) To have input on specific practices, outside agencies should work with the Regional Offices for adoption of standard contract language in addition to periodically reviewing specific operations on the individual forests.

3) The Lower Salmon project is a good candidate for annual review during and after timber harvest.

4) A study similar to this one should be conducted at a later date after more forest operations that are tiered to the forest-wide plan have been implemented.

PLANNING PROCEDURE FOR FOREST ACTIVITIES

General Planning.

The planning procedure for activities on the National Forests has changed substantially in the last decade. General planning is now governed by the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) (16 U.S.C. §1600 et seq.) and regulations promulgated thereunder, as amended by the National Forest Management Act of 1976 (NFMA). Prior to RPA-NFMA, functional planning predominated. Separate plans were prepared for each resource and principal planning efforts were directed toward the timber function. Under RPA-NFMA, forest planning became integrated land and resource management planning with interdisciplinary consideration of all forest resources, particularly outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness.

RPA-NFMA provides for planning at the national, regional, and forest levels. At the national level, the Chief of the Forest Service prepares an RPA Assessment that includes an analysis of present and anticipated uses, an inventory of present and potential renewable resources, and an evaluation of opportunities for improving the yield of goods and services from renewable resources. Based on data in the Assessment, the Chief prepares an RPA Program which includes identification of national renewable resource goals and objectives for outputs and other benefits and tentative assignment of objectives for each region

and forest planning area.

At the regional level, the regional forester develops a regional guide which includes an analysis of the existing management situation, establishment of regional standards and guidelines, and tentative assignment of objectives for each forest.

At the forest level, the level of particular interest here, the forest supervisor develops a land and resource management plan which directs and establishes management standards for all subsequent activities on the forest. According to planning regulations, ten steps are involved in the forest-wide planning process:

- (1) Identification and evaluation of public issues, management concerns, and resource use and development opportunities (ICOs);
 - (2) Preparation of planning criteria;
 - (3) Collection of inventory data and information;
 - (4) Analysis of the management situation;
 - (5) Formulation of alternatives;
 - (6) Estimation of effects of alternatives;
 - (7) Evaluation of alternatives;
 - (8) Recommendation of the preferred alternative;
 - (9) Approval of plan; and
 - (10) Monitoring and evaluation during implementation of plan
- (36 C.F.R. § 219.12).

Preparation of the forest plan takes place in the forest Supervisor's Office by an interdisciplinary team selected by the Supervisor. Regulations instruct the team to "integrate knowledge of the physical, biological, economic and social sciences, and the environmental design arts in the planning process [and to] consider problems collectively, rather than separating them along disciplinary lines (36 C.F.R. § 219.5)."

As well as providing direction from the national level down to the forest districts, this whole process is meant to send feedback from the ground up to the national level. On-the-ground, district-planned operations test the feasibility of the forest-wide plan; data for the forest-wide plan determine if regional goals can be met; and regional feedback may result in reevaluation of national targets.

Planning under RPA-NFMA must follow the procedural requirements of the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. § 4321 et seq.). This includes extensive public participation throughout the planning stages and preparation of an Environmental Impact Statement (EIS) concurrent with plans. Several of the planning steps listed above are largely a reiteration of NEPA requirements, as is the use of an interdisciplinary team. The NEPA procedure is intended to inform publics of federal actions and to aid federal officials in making decisions that include consideration of environmental consequences.

NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. . . . Ultimately, of course, it is not better documents but better decisions that count. . . . The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment (40 C.F.R. 1500.1).

Forest and regional plans must also be coordinated with related planning efforts by other agencies -- federal, state, tribal, and local. This would include, for example, the Idaho Department of Fish and Game's (IDFG's) five-year fish management plans and the Northwest Power Planning Council's Fish and Wildlife Program.

Specific Planning.

While the NFMA forest plan provides direction for activities on the ground, it is not intended to plan specific operations. NEPA requirements for an interdisciplinary, environmental analysis guide the planning procedure for individual operations. USFS policy for planning specific operations is presented in the National "Gates" System, a scheduling format developed in the early 1980s.

Timber sale preparation must pass through critical quality control, scheduling, and accomplishment reporting points, called "gates," each of which require (sic) specific outputs prior to proceeding to the next gate. The processes leading toward these gates follow:

| <u>GATE NUMBER</u> | <u>GATE TITLE</u> | <u>PROCESSES (ACTIVITIES)</u> | <u>KEY ACTIVITIES</u> |
|--------------------|--------------------------------|--|---|
| 1 | Position Statement | Position Statement Development | Scoping, sale area selection, silvicultural exams, area logging/transportation analysis, economic feasibility, budget, and scheduling |
| 2 | Decision | Sale Area Design | Environmental and economic analysis, resource reviews, project transportation/logging analysis, decision making, prepare project activity plan, and silvicultural prescriptions |
| 3 | Timber Sale Preparation Report | Sale Plan Implementation | Includes all field layout activities, document items for use in preparing appraisal, contract preparation, offering, and sale area improvement plan |
| 4 | Advertisement or Notice | Final Package Preparation, Review, Appraisal, and Offering | Appraisal, sample contract, advertisement, prospectus |
| 5 | Bid Opening Date | Bid Opening | Review bids, hold auction, tentative high bidder |
| 6 | Sale Award | Sale Award | Complete award activities |

(Forest Service Manual § 2431). This system permits procedural

and substantive flexibility between regions and between forests. It specifically allows variation in the order of accomplishing the various activities. However, as formal USFS policy, it requires preparation of specific documents before passage through each gate. To assure compliance with NEPA requirements, the system specifically prohibits any sale plan implementation until the environmental analysis is completed.

The typical procedure followed on the Clearwater National Forest for sales greater than two million board feet (MMBF) demonstrates these procedures. Individual operations are planned and implemented at the district level with some review at the Supervisor's Office. Once district personnel identify an area for a specific project, the district ranger sends a Project Initiation Letter or Letter of Management Intent to interested publics and forest personnel requesting ICOs. This initiates public involvement and generally signals placement of the proposed sale on the 10-year plan. From the ICOs, the district ranger develops a Position Statement, a preliminary assessment of project feasibility. This statement is sent to the Forest Supervisor for determination whether to continue planning the project. After approval by the Supervisor, an interdisciplinary team appointed by the district ranger conducts an environmental analysis that usually results in a formal Environmental Assessment (EA). The EA is generally reviewed by staff at the Supervisor's Office before the Supervisor's approval and signature of the Decision Notice and Finding Of No Significant

Impact (FONSI). The Decision Notice formally serves to notify publics of the decision, and the FONSI serves to determine no EIS is required. Since this process is meant to resolve anticipated problems before the EA reaches his desk, the Supervisor's "decision" is generally pro forma. While material is being gathered for the EA, a Transportation Plan is prepared if the project entails new road construction or appreciable reconstruction. Logging Systems Plans and Silvicultural Prescriptions are also prepared at the same time as the EA.

After the EA is signed, the district office completes the Project Plan, the paper design of the preferred alternative that directs implementation on the ground. This step includes locating P-lines and landings for a road construction and setting timber sale boundaries (unless boundaries are a particular issue needing coverage by the EA). The Project Plan typically includes a Sale Area Improvement (SAI) Plan. The latter plan grew out of a 1930 act, in which Congress authorized the Secretary of Agriculture to require cash deposits from a timber purchaser to cover costs of regeneration and stand improvement (16 U.S.C. § 576b). NFMA subsequently authorized the use of these K-V funds (so named after the authors of the 1930 act) for preservation and enhancement of all the renewable resources of forest lands. These sale area improvement operations are frequently planned as opportunities to improve fish habitat.

After the Project Plan is completed, actual ground preparation takes place: for example, layout of the logging

units, marking and cruising of timber, and survey of the transportation system. It is at this point that mitigation measures or management constraints are located. These include identification of riparian management zones, erosion control areas, floodplains, wetlands, and other protected habitat. The Timber Sale Report that summarizes data from this on-the-ground activity is used to develop the Appraisal and Contract. At this point, the process moves into the business of advertising the operation, awarding the bid, and execution of the contract. This procedure, from initiation to sale, may take up to ten years to complete.

From here the process moves into implementation. For large timber sales, full implementation may take up to seven years. To assure compliance during implementation, several precautions are taken. A Contracting Officer out of the Supervisor's Office is assigned to the operation and is solely responsible for administration of the contract. Under the Contracting Officer are a Forest Service Representative, an Engineering Representative, and a Timber Sale Administrator. For larger sales, a Harvest Inspector and a Road Inspector may also be appointed. The different positions have authority over different portions of the ground activities. Each position carries with it authority to alter plans when ground conditions dictate. For example, the Timber Sale Administrator has authority to alter length or location of culverts, modify slash placement, and lengthen operating season when weather permits. When ground

conditions require an actual change in the sale contract, only the Contracting Officer has the authority to make such a change. Contract changes are typically minor alterations (e.g., cost discrepancies). If ground conditions reveal that the EA cannot be met, only the person who signed off on the EA has authority to amend the document. If a significant change is dictated, the amendment must go through the public review process. Each of the administrators, representatives, and inspectors maintains a diary of activities observed at the site, problems that arise, and resolution of problems. The Timber Sale Administrator and Road Inspector typically spend more time on-site than the other representatives. Approval of the road upon final inspection is usually assured because of the daily monitoring and correction of activities. Other than the final road inspection, evaluations of projects after completion vary from forest to forest and project to project, as demonstrated below by the case studies.

CONSTRAINTS FOR PRESERVATION OF WATER QUALITY

Statutory constraints for preservation of water quality are contained in RPA-NFMA itself. The Act requires that the RPA Program include recommendations that "recognize the fundamental need to protect and, where appropriate, improve the quality of soil, water, and air resources (16 U.S.C. § 1602(5)(c))." The Act also requires that regulations promulgated for development of forest plans specify guidelines which:

[I]nsure that timber will be harvested from National Forest System lands only where--(i) soil, slope, or other watershed conditions will not be irreversibly damaged; (ii) there is assurance that such lands can be adequately restocked within five years after harvest; (iii) protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment, where harvests are likely to seriously and adversely affect water conditions or fish habitat (16 U.S.C. § 1604(g)(3)(E)).

The Act also requires that plans provide for multiple use and sustained yield management in accordance with the Multiple-Use Sustained Yield Act of 1960 (16 U.S.C. § 528 et seq.). The multiple uses include watershed and wildlife and fish. Compliance with NEPA is also emphasized in NFMA and its regulations. So, for example, when high water quality and fisheries are identified as concerns, NEPA requires assessment of impacts on these resources.

The regulations promulgated pursuant to RPA-NFMA contain numerous provisions for preservation of fish and water resources. For example, lands are to be classified as unsuitable for timber

production if "[t]echnology is not available to ensure timber production from the land without irreversible resource damage to soils productivity, or watershed conditions." All management prescriptions must "[c]onserve soil and water resources [and] protect streams, streambanks, shorelines, lakes, wetlands, and other bodies of water [and] provide for adequate fish and wildlife habitat to maintain viable populations." Even-aged timber cuts must be "carried out in a manner consistent with the protection of soil, watershed, fish and wildlife." For riparian areas, "[n]o management practices causing detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment shall be permitted within these areas which seriously and adversely affect water conditions or fish habitat (36 C.F.R. § 219.14(a), 219.27(a), (c), & (e))."

The regulations also specifically require compliance with the Safe Drinking Water Act and the Clean Water Act (CWA) (36 C.F.R. § 219.23(d)). Although not totally unrelated (e.g., turbidity does affect the cost and efficacy of treatment for potability), the Safe Drinking Water Act is presently not used for NPS control. NPS pollution is primarily regulated through CWA provisions. Under the CWA, NPS is essentially controlled by the states, with EPA approval of plans and programs required for receipt of federal CWA funds.

In Idaho, water quality is regulated by the Idaho Environmental Protection and Health Act (Idaho Code § 39-101 et seq.) and the Water Quality Standards (16 IDAPA § 01.2000 et seq.)

promulgated by the Division of Environment within the Idaho Department of Health and Welfare (IDHW-DOE). Idaho's Water Quality Standards are based on designated beneficial uses of water bodies and criteria to protect those uses. The water use classifications are agricultural water supplies, domestic water supplies, cold water biota, warm water biota, salmonid spawning, primary contact recreation, and secondary contact recreation. Most waters on the National Forests considered in this report are classified for cold water biota or salmonid spawning. Criteria for these two classifications are dissolved oxygen greater than 6 mg/l; pH between 6.5 and 9.0; total dissolved gas less than or equal to 110% saturation; un-ionized ammonia at a mean of 0.04 mg/l; and temperature no greater than 13°C with a daily average no greater than 9°C for salmonid spawning, and no greater than 22°C with a daily average no greater than 19°C for cold water biota (16 IDAPA §§ 1-2100, 1-2250.04, & 1-2250.05).

With respect to silvicultural practices, IDHW-DOE has approved the Idaho Forest Practices Act rules and regulations as Best Management Practices (BMPs). This means that the rules and regulations, administered by the Idaho Department of Lands, are recognized as the means to minimize NPS pollution from silvicultural sources. These regulations specifically apply to State and private lands within Idaho.

For silvicultural practices on National Forest lands, Idaho and the USFS entered into a Cooperative Agreement in 1976 that requires USFS activities to meet or exceed Idaho BMPs. Since

1980, this agreement has also specifically required the USFS to monitor sample operations. "The Forest Service agrees: ... To accomplish water quality management requirements by: ... Monitoring and evaluating selected management activities to determine how well objectives are being or have been met, followed by timely incorporation of necessary adjustments into plans and future management activities to reasonably insure maintenance of environmental quality (Addendum to Cooperative Agreement)." Revision of this agreement to include recent regulatory changes is presently being discussed (Bauer 1987). To date, the USFS has only partially fulfilled its obligations under this agreement. One study has shown that USFS practices do, for the most part, indeed meet or exceed Idaho BMPs. In a review of 25 forestry operations on State, private, and National Forest lands, Idaho's Silvicultural Task Force found that USFS sites overall "use practices in excess of those required in the proposed [Idaho Forest Practices Act] Rules. Administration of forest practices provided high levels of water quality protection (IDHW-DOE 1985a)." However, as will be demonstrated by the case studies, the USFS has been remiss in its compliance with the monitoring requirement of the Cooperative Agreement.

CASE STUDIES

Forest Background.

Specific operations on three northern Idaho National Forests were examined to assess the consistency between planned and implemented forest practices and water quality impacts. All three forests (the Clearwater, the Nezperce, and the Panhandle) are located in Region 1, the Northern Region of the USFS (Figure 1). Table 1 compares general information on the three forests. As the table shows, all three forests produce substantial amounts of timber and all three support significant coldwater fisheries and very high water quality. Also shown are appreciable increases in projected timber harvest and road construction.

Each of the three forests released a proposed forest plan and draft EIS in 1985 and the final documents in 1987. Each forest plan presents forest-wide goals and objectives for the various resources of the forest. The goals and objectives that specifically apply to fish and water resources are presented in Appendix A. Forest-wide standards are also provided for the resources on each forest. These standards supplement national and regional policies, guidelines, and standards. One general standard contained in all three forest plans is to make all existing and future permits and contracts consistent with the NFMA Plan. The Clearwater Plan also contains general, procedural standards for first entry into roadless areas. These standards, along with the pertinent resource standards for all three Plans are shown in Appendix B.

Figure 1.

U.S. Department of Agriculture
FOREST SERVICE REGIONS
in the
STATE OF IDAHO

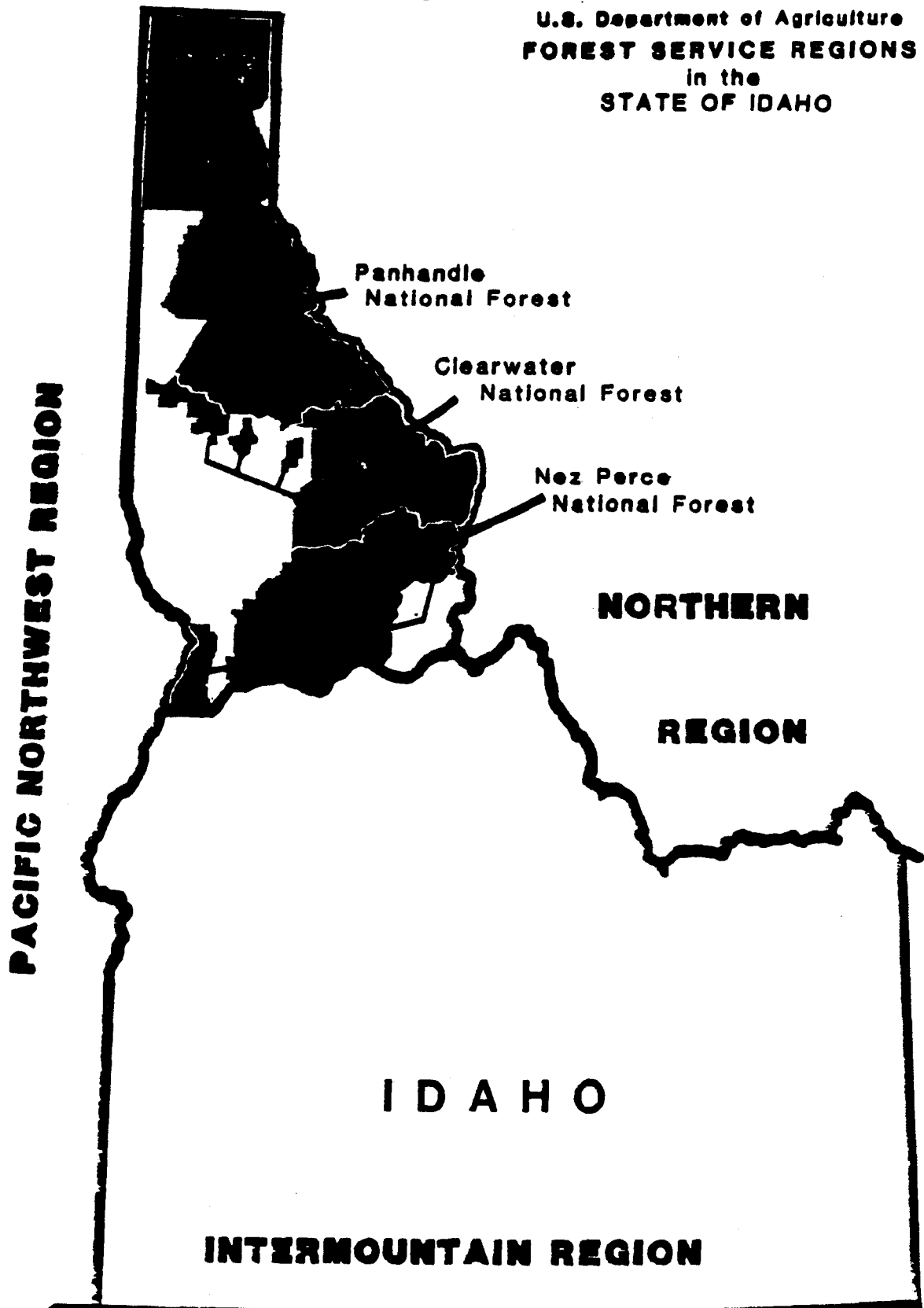


TABLE 1. GENERAL FOREST INFORMATION.

| | Clearwater ¹ | Nezperce ² | Panhandle ³ |
|---|-------------------------|-----------------------|------------------------|
| Size (acres) | 1,837,116 | 2,218,040 | 2,500,000 |
| Annual Timber Cut (MMBF) | 170 | 102 | 269 |
| Projected Cut, 1st Decade | 173 | 108 | 280 |
| Projected LTSY ⁴ Cut | 440 | 210 | 544 |
| Existing Roads (miles) | 4,275 | 2,050 | 6,000 |
| Projected Road Construction, 1st Decade | 690 | 608 | 1,760 |
| Roadless (acres) | 950,311 | 503,162 | 853,000 |
| Wilderness (acres) | 259,165 | 926,188 | 9,440 |
| Fisheries Habitat (stream miles) | | | |
| Anadromous | 714 | 8,800 | NA |
| Resident | 4,304 | 10,000 | 4,710 |
| Fisheries Potential | | | |
| Anadromous, smolts | 288,800 | 705,000 | NA ⁶ |
| adults | 7,300 | ? ⁷ | NA |
| 13,400 ch. | | ? | NA |
| Resident, trout | 598,435 | 364,000 | 451,300 |
| kokanee present | NA | NA | 1,600,000 |
| white fish present | NA | NA | 28,800 |
| Number of Lakes | 171 | 130 | 80 |
| Acres of Lakes | 1,909 | ? | 78,000 |
| Inventoried Riparian (acres) | 116,000 | 32,000 | ? |
| Overall Water Quality | Excellent | Good to Excellent | Good to Excellent |

¹Information from Clearwater Forest Final EIS (1987).

²Information from Nezperce Forest Final EIS (1987).

³Information from Panhandle Forest Final EIS (1987).

⁴LTSY = Long-Term Sustained-Yield

⁵st. = steelhead, ch. = chinook salmon

⁶NA = Not Applicable

⁷? = Information not provided in the EISs.

In addition to forest-wide goals, objectives, and standards, each of the three Plans divides its respective forest into specific management areas (MA) and each MA has specific goals and standards. The Clearwater has 17 MAs, the Nezperce has 26 MAs, and the Panhandle has 19 MAs (Appendix C). For comparison, the goals and standards for the Riparian Management Areas are given in Appendix D.

To ensure that these general goals and standards are met during planning and implementation of specific operations, NFMA requires monitoring and evaluation of projects (16 U.S.C. 1604(g)(3)(C)). Each of the three forest plans contains a monitoring and evaluation section. This section includes goals, an action plan for monitoring, a decision flow diagram to guide evaluation of data, and requirements for evaluation reports. In addition, the Nezperce Plan includes more monitoring details in an appendix. The monitoring and evaluation portions of the plans are shown in Appendix E.

Specific Studies.

The following operations were studied:

- (1) East Bruin Timber Sale on the Panhandle,
- (2) Lower Salmon Road Construction on the Clearwater, and
- (3) Simmons/Butte Road Construction on the Nezperce.

Operations were chosen at the recommendation of USFS personnel as representative of the planning, implementation, and monitoring

process for recent activities and/or as having at least some evaluation of activities to allow comparison of plans with implementation.

The procedure used in planning these sample operations did not completely parallel the National "Gates" System discussed above. The "Gates" process was being developed and tested when these sample operations were in the early planning stages. This situation illustrates the evolving nature of the planning procedure for specific operations on the National Forests. Similarly, the technical parameters addressed in planning documents evolves with changes in management direction. Just a few years ago, for example, watershed management was largely concerned with alterations in water yield. Today, watershed specialists emphasize minimizing erosion and sediment delivery to streams. The evolving nature of both the procedure and the substance of planning documents should be kept in mind when comparing the three case studies.

While it was hoped that documented evaluation of operations would be sufficient to assess agreement between plans and implementation, it was found that monitoring and evaluation of operations, as anticipated by NFMA, had not yet been adopted. Of the three forests, the Panhandle is doing the least amount of interdisciplinary or multi-disciplinary follow-up monitoring. Other than use of road inspectors and Timber Sale Administrators as discussed above, the only routine evaluation on the Panhandle is one administrative inspection per district per year (Faulkner

1987)). This inspection, which is not of a multi-disciplinary or interdisciplinary nature, basically serves to educate Timber Sale Administrators and obtain uniformity of administration between districts. The East Bruin Timber Sale will illustrate how particular operations were planned, implemented, and monitored prior to NFMA forest-wide planning. Since it is the only operation of the three that is now completed, the East Bruin Sale will also show the extent of material included in the permanent public files.

More recent operations have been planned in accordance with NFMA. The Lower Salmon Road Constuction was planned using NFMA policy and guidelines and forest standards developed under early drafts of the forest-wide plan. Description of this operation will serve to illustrate (1) the extent of involvement of multiple-resource personnel in planning and (2) the anticipated procedure under the approved forest plan for the Clearwater National Forest. The Simmons/Butte Road Construction was planned about the same time as the East Bruin Creek Sale: planning had some influence of the forest-wide planning process, though not as much as for the Lower Salmon project on the Clearwater. Both the Lower Salmon and Simmons/Butte projects were chosen for this study because of their inclusion of monitoring during implementation of part of the projects. Neither project, however, has yet been established as a sample operation for monitoring under the forest plan monitoring action plan.

East Bruin Timber Sale, Idaho Panhandle National Forests.

The East Bruin Sale was proposed and internal scoping for ICOs took place in 1981; the EA was prepared in 1982; the sale took place in 1984; the operation closed in 1987. This sale is a good example of pre-NFMA planning. Unlike the Clearwater and Nezperce National Forests, the Idaho Panhandle National Forests did not begin tying its specific project planning to NFMA policy and guidelines until the proposed forest plan was released in 1985. Prior to 1985, it followed the guidelines of pre-NFMA land use plans: concerning general multiple use objectives of the East Bruin Sale, for example, the silvicultural prescriptions refer to the 1975 Idaho Panhandle Forest Land Use Plan.

The sale area was located in the lower portions of the Bruin Creek drainage on the Red Ives District, which is now part of the Avery District (Figure 2). The total area comprised 4,050 acres, of which 1,635 acres had already been harvested. When the sale was initially proposed in 1981, it was reviewed by various personnel in the Supervisor's Office and the District Office. Comments applicable to fisheries or water quality were submitted by the forest hydrologist and the wildlife biologist for Avery District. At that time, the major impacts to Bruin Creek were seen as having already occurred from previous logging activities in the drainage. Despite these impacts, the creek was classified as being in "fair" condition, a stability rating that could be raised to "high-fair" if some debris cleanup took place. No further significant impacts to the creek were anticipated. For

14 N

Figure 2.

East Bruin

- Forest Service BD Work -

— Firebreak Construction (hand)

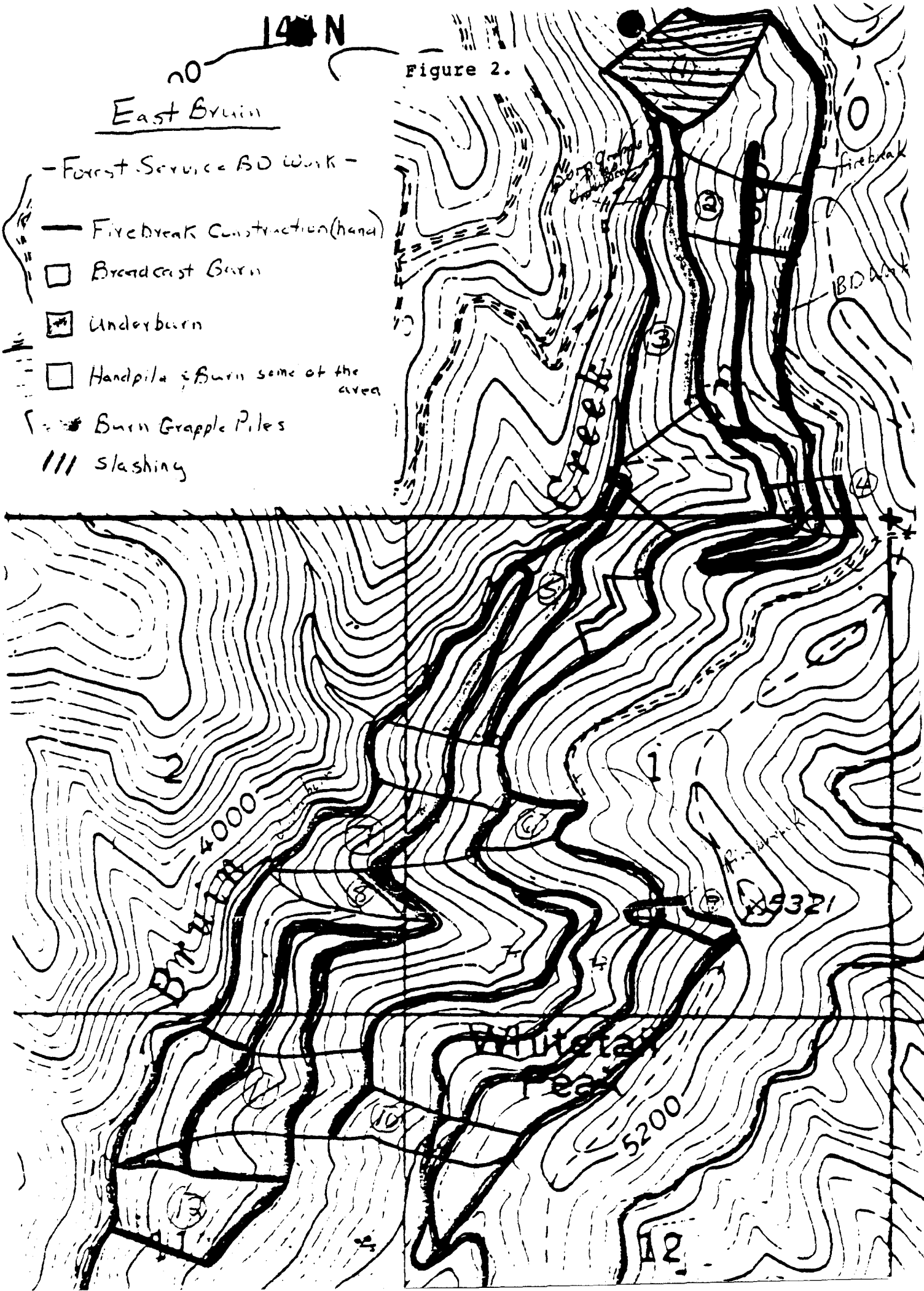
□ Broadcast Burn

▣ Underburn

□ Handpile & Burn some of the area

~ ~ ~ Burn Grapple Piles

/// Slashing



fisheries, it was noted that (apparently natural) log recruitment into the creek and the road culvert at the mouth of the creek were barriers to migration of trout. The wildlife biologist recommended some harvesting in the riparian zone to reduce log recruitment into the creek, emphasizing directional tree felling to avoid bank degradation and sedimentation, and collection of K-V funds for stream cleanout, habitat improvement, and mitigation of impacts from the road culvert barrier (Gertsch 1981).

The EA text (which consisted of just over 6 pages) contained no mention of fish, fisheries habitat, or water quality. The document presented a proposed action and three alternatives. The "No Action" alternative was rejected apparently because "Removing the overstory at some later date ... would result in greater potential for logging damage to the residual stand (East Bruin EA p.6). The preferred alternative proposed harvest of 4.5 MMBF on 290 acres, a harvest level approximately midway between the other two development alternatives. No new road construction was foreseen, and reopening of existing roads was restricted to the minimum necessary for the logging operation. Mitigating measures included closing and seeding all reopened roads, collecting K-V funds for stream cleanout of Bruin Creek, and incorporating the aforementioned wildlife biologist's recommendations where feasible. The EA sections on affected environment and environmental impacts included soils and watershed. The EA predicted low surface erosion potential and low to moderate road prism erosion hazard. The existing, closely spaced logging roads

that laced the project area were considered to be very stable with only a few, minor cutbank failures. Watershed impact discussion centered around an increase in water yield with only passing mention of sediment loading increases due to harvesting activities. The allowable water yield increase had been set at 8% with the preferred alternative water yield increase estimated at 6.5%. No specific timber harvest or road construction practices were included in the EA.

Commenting on the EA, the fisheries biologist in the Supervisor's Office expected little impact on the fish habitat in Bruin Creek, a stream with the potential to produce more than 5,000 smolts. To avoid sediment delivery to Bruin Creek, she recommended that roads be adequately maintained with sufficient cross-drains and road dips at all stream crossings followed by closure and seeding after the sale. She also recommended some timber harvest in the riparian zone, particularly in areas where large trees were falling into the stream creating sediment problems and barriers to fish movement. To provide St. Joe River cutthroat spawners access to Bruin Creek and to increase spawning habitat, the fisheries biologist recommended that the following enhancement opportunities be added to the EA: (1) correction of barriers from debris jams, cascade blocks, and the road culvert at the mouth of Bruin Creek and (2) installation of log pool structures. The total cost of these projects was estimated at about \$4,300 (Wise 1982).

In addition to these suggestions, the Forest Supervisor

wrote the Red Ives District Ranger when approving the EA stating, "There is opportunity to significantly improve fisheries I would like you to consider. Please consult our fisheries biologist for recommendations (Kizer 1982)." No EA amendments or other documents reflecting these suggestions were included in the East Bruin Creek Timber Sale file.

The sale area was composed of 12 harvest units ranging in size from 9 to 73 acres, each with a specific silvicultural prescription that was prepared at about the same time as the EA. A sample prescription is shown in Appendix F. The following pertinent objectives were included in each silvicultural prescription.

1a. Protect and enhance existing and potential wildlife, bird, and fisheries habitat for both game and non-game species

2a. Protect and enhance the soil and water resource as per Forest Watershed Quality guidelines.

The remainder of the prescriptions dealt primarily with timber. Harvest practices were not delineated in the silvicultural prescriptions. Although one unit did include a marking plan which presented practices for marking leave trees and wildlife trees, the only specific mention of harvest practices was a multiple use objective stating, "Optimize timber production through the use of silvicultural practices which are consistent with [the silvicultural] objectives below (IPNF 1982b)."

The Timber Sale Report and Appraisal was the major document

prepared after the EA. This report included a Cruise Plan, a Slash Treatment Plan, Fuels Management Prescriptions, and a Sale Area Improvement and K-V Collection Plan. The latter included provision for stream cleanup and road seeding. For stream cleanup, however, only economic data were given: no particular activities were described.

The only portion of the Timber Sale Prospectus that addressed non-timber resources dealt with measures for wildlife; this portion was later replaced by further provisions for timber harvesting.

The actual Timber Sale Contract is a lengthy document consisting of two main parts: the standard provisions, which are all applicable unless specifically stated otherwise, and the special provisions for each individual sale. The last standard provisions portion was written in 1973 and is presently undergoing revision. The specific special provisions are chosen from pre-formulated provisions; any changes in wording must receive advance approval from the Regional Forester. Particularly pertinent standard provisions included in the East Bruin Creek Timber Sale Contract are those for streambank protection and erosion prevention and control:

B6.5 Streamcourse Protection. "Streamcourses" which are subject to provisions of this Section are shown on Sale Area Map. Unless otherwise agreed, the following measures shall be observed to protect Streamcourses: (a) Purchaser's Operations shall be conducted to prevent debris from entering Streamcourses, except as may be authorized under paragraph (d). In event Purchaser causes debris to enter Streamcourses in amounts which may adversely affect the natural flow of the stream, water quality or fishery resource, Purchaser shall

remove such debris as soon as practicable, but not to exceed 48 hours and in an agreed manner that will cause the least disturbance to Streamcourses.

(b) Culverts or bridges shall be required on Temporary roads at all points where it is necessary to cross Streamcourses. Such facilities shall be of sufficient size and design and installed in a manner to provide unobstructed flow of water and to minimize damage to Streamcourses. Trees or products shall not be otherwise hauled or yarded across Streamcourses unless fully suspended.

(c) Wheeled or track-laying equipment shall not be operated in Streamcourses except at crossings designated by Forest Service or as essential to construction or removal of culverts and bridges.

(d) Flow in Streamcourses may be temporarily diverted only if such diversion is necessary for Purchaser's planned construction and Forest Service gives written authorization. Such flow shall be restored to the natural course as soon as practicable and in any event prior to a major storm runoff period or runoff season.

B6.6 Erosion Prevention and Control. Purchaser's Operations shall be conducted reasonably to minimize soil erosion. Equipment shall not be operated when ground conditions are such that excessive damage will result. The kinds and intensity of erosion control work done by Purchaser shall be adjusted to ground and weather conditions and the need for controlling runoff. Erosion control work shall be kept current immediately preceding expected seasonal periods of precipitation or runoff. If Purchaser fails to do seasonal erosion control work prior to any seasonal period of precipitation or runoff, Forest Service may temporarily assume responsibility for the work and any unencumbered deposits hereunder may be used by Forest Service to do the work. If needed for such work, Purchaser shall make additional deposits on request by Forest Service (USDA-FS, Timber Sale Contract, p.121).

Other standard erosion prevention provisions are shown in Appendix G. Special provisions in the East Bruin Creek Contract that supplement these standard provisions are as follows:

C6.51 - Felling of Timber Along Streamcourses. (10/82)
Trees designated for felling along Streamcourses shown on Sale Area Map shall be felled, insofar as topography and lean permit, so that tops land at least 50 feet from Streamcourse. Use of felling wedges to control direction of fall shall be required.

C6.6 - Erosion Prevention and Control. (11/74)

A. Purchaser shall locate Temporary Roads according to operating schedule

B. Skidding with tractors within 100 feet of live streams shall not be permitted except in places designated in advance by Forest Service, and in no event shall skid roads be located in live or intermittent Streamcourses. Skid trails shall be located high enough out of draws, swales, and valley bottoms to permit diversion of runoff water to natural undisturbed forest ground cover.

C. During periods of accelerated water runoff, especially during the spring runoff and periods of heavy rainfall, Purchaser shall inspect and open culverts and drainage structures, construct special cross ditches for road runoff, and take other reasonable measures needed to prevent soil erosion and siltation of streams.

D. Tractor skid trails in excess of 20 percent shall be permitted only upon written agreement.

E. Temporary Road surface width shall be limited to truck bunk width plus 4 feet

F. Unless otherwise agreed in writing, Purchaser shall keep erosion control work current with his operations under the sale and in any case not later than 15 days after completion of skidding on each unit or subdivision.

C6.601 - Erosion Control Seeding. (10/75) Following completion of skidding and yarding operations in an area, Purchaser shall seed those exposed areas of critical raw soil on skid trails, landing, firebreaks, and Temporary Roads where other erosion control measures described in C6.6 will not result in satisfactory control of soil movement. Soil on areas to be seeded shall be left in a roughened condition favorable to the retention and germination of the seed (Idaho Panhandle National Forests 1984).

In addition, contract provisions contain the specific timber harvesting and road construction practices to be observed by operators. For example, under Conduct of Logging, standard language requires particular stump heights, bucking lengths, felling procedures, etc.

After the contract was signed, personnel were appointed with

specific authority to represent the Government in the administration of project activities. Each of the representatives was assigned particular responsibilities. These personnel reported activities throughout the duration of the operation. Most reports were routine explanations of what was observed on particular days at various sites. One Daily Diary report of the Engineering Representative mentioned a possible drainage problem with one of the road ditches; no further discussion of the problem was found in the file. The Timber Sale Inspections of the Sale Administrators addressed several relevant problems encountered during on-the-ground activities. They recorded the need for more waterbars in roads of three units, discussions with purchaser representatives regarding erosion control items to be in place before leaving for the winter, and the investigation of a road slump. This latter problem eventually led to a substantial contract amendment. The first Timber Sale Administrator reported on July 2, 1985, "I investigated a road slump in Unit 12 on the 3376 A Road. Reconditioning as planned would likely increase the risk of mass failure. The entire unit can still be harvested as designed because the slump area is less than 200 feet from the end of the unit boundary. Whether or not harvesting the timber would increase the risk of failure is not known. I will involve soils and/or geotech personnel in this decision (Sheridan 1985a)." On July 18th, he reported, "The road slump concern on #3376 has been resolved. The road be (sic) reconstructed to the slump and the

unit will be harvested as planned (Sheridan 1985b)." On October 30th, the second Timber Sale Administrator reported, "There has been an unusual amount of soil movement observed in unit 12. I have contacted Jerry Niehoff the soil specialist from the [Supervisor's Office] to look over this area. Until that time I have instructed the purchaser and contractor not to operate in unit 12 until we have a report from the soil specialist (Bess 1985)." On October 31st, the soil scientist sent a report of his inspection to the Forest Supervisor detailing what he had observed and what effects timber harvesting would have in the unit, and recommending that Unit 12 be withdrawn from the sale with existing trees remaining on site to stabilize the area (Niehoff 1985). Shortly thereafter, the sale contract was amended deleting unit 12 from the sale.

Both the district office and the Supervisor's Office had checklist forms that were completed before closing the sale. Neither form contained any mention of satisfactory stream conditions, satisfactory soil conditions, or satisfactory erosion prevention measures. Rather, these forms only checked whether certain paperwork had been completed.

The stream cleanup provided for in the K-V Plan was conducted in field season 1987. Forty-six barriers from natural conditions and previous activities in the drainage were partially removed. According to the district wildlife biologist, partial removal is preferable to complete removal to prevent excess sediment from moving downstream and to enhance cover and food for

fish. The biologist felt a good job was done on the cleanup (Okula 1987).

Throughout this discussion, mention of Bruin Creek's present fishery was intentionally avoided, because no mention was made in any of the file documents. However, an interview with the district's wildlife biologist revealed that this stream is classified as very important spawning and rearing habitat for the St. Joe River westslope cutthroat and bull trout (Okula 1987).

Lower Salmon Road, Clearwater National Forest.

This timber sale and road construction project is ongoing, and, thus, not all planning materials are on file in the Supervisor's Office. To date only the road is completed. The area abuts the north shore of the upper end of Dworshak Reservoir and encompasses Salmon Creek, Syringa Creek, Milk Creek, and two unnamed drainages (Figure 3). It is located on the North Fork Ranger District, on the portion formerly known as Canyon District. The planning area was previously unroaded, although logging and road construction had occurred in the headwaters of Salmon Creek during the 1960s. The nearest road was the Salmon Ridge Road #700. Extensive wildfire activity around 1930 led to considerable sediment transport to the creeks through debris avalanches. Most of the area shows evidence of mass-wasting. Sediment impacts to Salmon Creek are extensive: levels estimated as high as 500% over natural levels occurred during the early 1970s. The watersheds are considered to be very unstable with natural sediment production twice as high as average watersheds. "Practically any disturbance risks extended degradation (Lower Salmon EA p.24)."

Salmon and Milk Creeks have resident cutthroat fisheries ranging up to 8" in size. Both have significant spawning and rearing habitat, although cobble-embeddedness is presently around 70%. Syringa and the unnamed creeks primarily serve as water quality feeder streams, but do have minor spawning potential and support a limited cutthroat fishery. Surveys to date have not

LOWER SALMON TIMBER SALE PROPOSAL

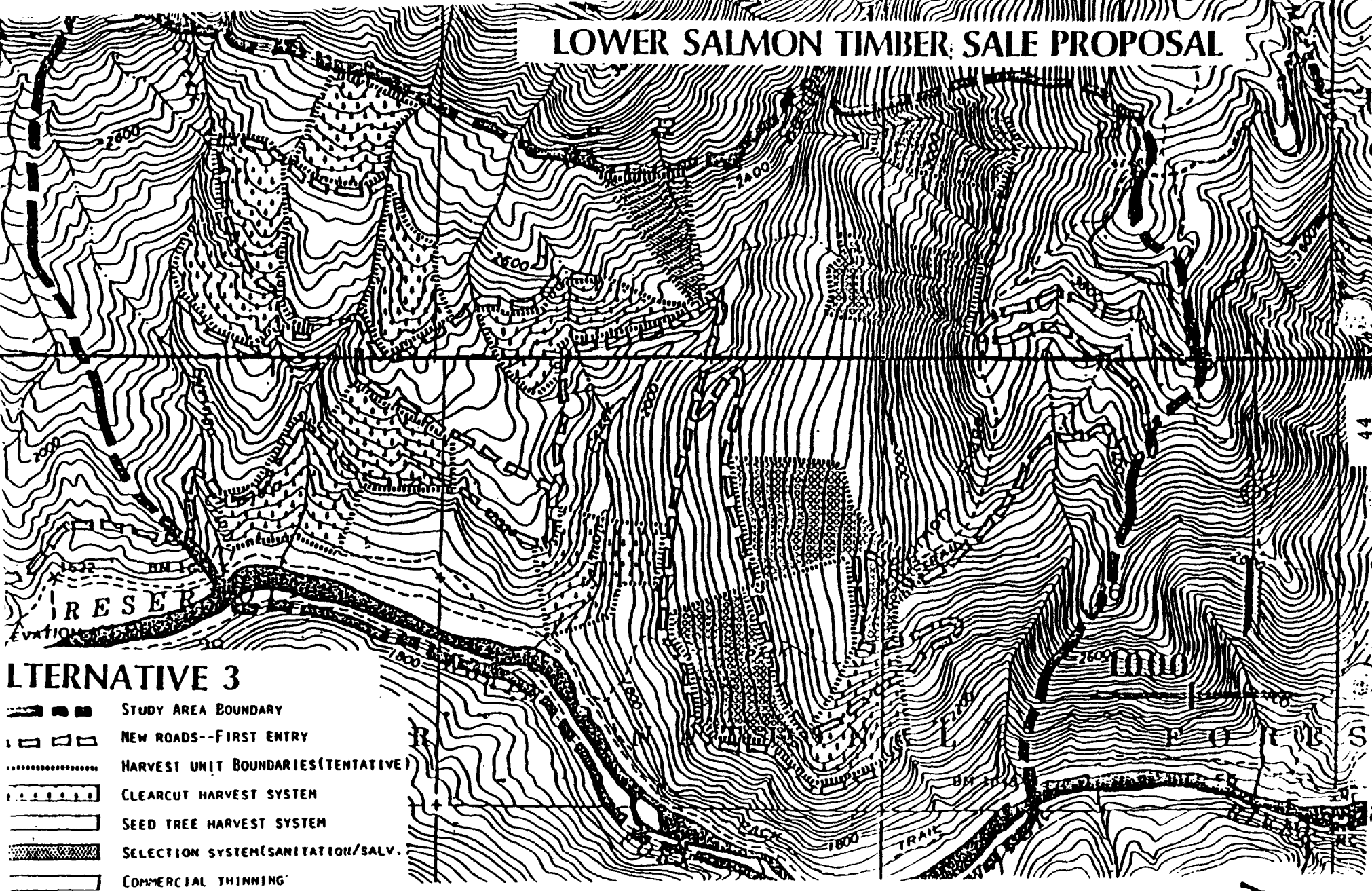


Figure 3.

A3

found the kokanee salmon of Dworshak Reservoir utilizing any of these streams.

The project was initially planned before NFMA became law. The Engineers' Reconnaissance Report of 1975 presented the management alternatives established under the old plans as timber, wildlife (elk), and recreation. The report anticipated that logging this area would require more paper planning than usual due to difficulties of placing roads in this mass-wasted area. Public impacts identified at the time included possible loss of water quality and degradation of fisheries. The district originally designated a sale of 15 MMBF in 1980. This plan was later withdrawn because of the area's essentially roadless characteristics.

In early 1982, after the area was released from further roadless area consideration, the district began assessment of ICOs for a sale in the area. At that time, the wildlife biologist identified no fisheries concerns or opportunities. A Project Feasibility Letter (PFL) formally soliciting ICOs (apparently something akin to a Position Statement) was distributed in March, 1982. The objectives of the project were stated as developing a management plan for the area and logging some 13 MMBF of mature and overmature timber to help meet the district's assigned timber sell for 1984. The PFL considered the most probable equipment access and log transportation route to be Dworshak Reservoir.

Several comments to the PFL included water quality and water

use issues. The zone engineers noted that because of slopes and soils, "the only environmentally safe access is via Dworshak Reservoir." Further, they found the area to be "valuable for wildlife and water." They identified several significant problems and data needs from the special circumstances involved in barging equipment up the reservoir and transporting logs down the reservoir. Finally, they cited "pollution from tree bark and sinking logs" not only as a critical public issue and management concern, but also as an opportunity to improve fishing (Card and Flowers 1982). Another comment at this time stated, "It appears that we should concentrate on a feasible road location(s) on the ground, soon --- as that will determine what we can, and have to do, in logging. Evidently there is much concern over the geology and soils of the area, so we need the lead time (Gale 1982)." In response to the PFL, the soil scientist for the forest filed comments based on a reconnaissance study of the area he and the forest hydrologist had made the previous summer. He found that the unique soils and lack of an ash cap could present a "severe soil compaction problem" and "Unusual silviculture and stability problems could present cutting restrictions and surface soil erosion problems (Wilson 1982)." He noted that extensive mass wasting had followed the ca. 1930 wildfire. In addition to these soil and topography concerns, the forest hydrologist noted, "Streams are unstable and are sensitive to sediment loading (Patten 1982)." The hydrologist further cited failures of the Salmon Ridge Road #700 that caused damage to nearby streams as

demonstrative of the risks involved here. He recommended extensive survey and site specific prescriptions for the sale and careful planning of the landings at the reservoir where massive slumping would likely result from the fluctuating water level. The fisheries biologist for the forest suggested maintenance of water quality and aquatic habitat as a resource objective for the project and suggested maintenance of cobble-embeddedness at less than 25% as an evaluation criterion. At that time, the biologist included no recommendations for fish preservation, apparently because of a misunderstanding that surveys of the creeks showed no fish to be present. However, he did recommend inclusion of mitigation measures regarding riparian zone management and road placement for erosion control purposes (Espinosa 1982). Another Forest Service employee suggested fish should be a lesser concern here with respect to road placement because the slow-moving waters in the area made cemented gravels unimportant (Kuested 1982). Several comments were filed requesting access to the area by road instead of, or in addition to, access by water. Without land access, harvest costs would be too high, competitive bidding would be infeasible, and after-harvest access for management by USFS would be very difficult. Furthermore, dependence on permanent use of Army Corps of Engineers' barges on Dworshak Reservoir would be unreliable. One comment even went so far as to recommend disregard for watershed impacts if necessary to get road access to the area (Kuested 1982).

For this project, much of 1982 and 1983 was spent developing

road plans for location of roads within the project area and for connection to existing roads for land access. Field surveys of the area reported in a Stabilization Summary revealed 29 slides in excess of 10 cubic yards, 19 in excess of 50 cubic yards, and 9 in excess of 100 cubic yards. The forest hydrologist reported an investigation of an alternate route and stream crossing which found, "Although it traverses some very steep ground on the east side and some old slump topography, the risks of significant soil movement with incipient stream damage through blockages and/or long term sedimentation are reduced to a manageable and feasible level The stream crossing location is much improved due to the fact that the stream is well confined in its channel at a stable control section (Patten 1982)." For mitigation and stabilization, the hydrologist recommended some full-benching and subsurface drainage, surface erosion control measures, dispersion of sediment-laden drainage water, and minimization of the velocity of culvert discharge during peak flows.

The Transportation Plan described the area as "generally unstable with numerous natural slumps having been observed throughout the area (Lower Salmon TP p.1)." It required the transportation system to be "located, designed, and managed according to the Lower Salmon Environmental Assessment report" and required the design to include the hydrologist's recommendations related above. The remainder of the plan described typical engineering criteria (such as width of road, design vehicle, and construction of the log dump landing),

transportation alternatives by water and land, and an economic analysis of the alternatives. No mitigation measures were specifically enumerated in the Transportation Plan.

The EA released in 1984 was considered by many comments to be one of the more thorough reports reviewed. Apparently the original EA was modified after comments were received; only the final EA was on file in the Supervisor's Office. The stated purposes for the action were winter forage for big game, forest products, timber management, and transportation development in this unroaded area. No mention of fish, water quality, or riparian zone management was included in the specific concerns identified during the initial scoping process for the EA. However, soil stability was listed as a major concern. The EA referred to discussions after the initial scoping process regarding resource conflicts which concluded, "The highly unstable soils left no doubt about the potential for watershed and fishery impacts and higher than normal road maintenance costs (Lower Salmon EA p.2)." The interdisciplinary team (composed of a silviculturist, a wildlife biologist, a watershed specialist, and a fuels specialist) did include fish and water issues in its refined list of ICOs. Flow conditions in the creeks, mass-wasting, surface erosion, destabilization of slopes, and fish productivity were all included as management concerns. The team also found ample opportunity to enhance fisheries from K-V funds.

The EA considered six alternatives. In addition, other alternatives had been proposed but eliminated from further study:

some road alternatives posed too great a threat to fish habitat and watershed stability and one helicopter logging alternative, which would have reduced impacts on fish and water, was considered too costly. The "No Action" alternative was rejected apparently because it would not improve elk habitat and would indefinitely postpone development in this area that was scheduled for roaded management. The development alternatives ranged from "Optimum Wildlife" to "Maximum Silviculture." The objectives of the preferred alternative were to improve big game habitat within the constraints imposed by a connector road for land access to the area. Numerous management requirements addressed fish and water quality needs. The road construction measure required roads to be located, designed, and timed in a manner that would maintain watershed stability and a "high fishable" level of productivity in the creeks. This included review of road location and design by soils and watershed specialists; special design of stream crossings to maintain fish habitat and watershed; provision of fish passage; completion of road segments within the season begun; and several other measures to reduce erosion and maintain fish habitat and watersheds. Watershed and soils measures required management for favorable flows; deferment of harvest in unstable areas; riparian zone management; and control of soil compaction. The fish habitat requirement was maintenance of a "high fishable" level, i.e., 80% or more of potential productivity. While not specifically stated, the preferred alternative apparently also included pertinent

mitigation and monitoring requirements: "Include watershed, wildlife, recreation, and timber projects that mitigate impacts or enhance values in the SAI plan" and "Evaluate, primarily by observation, and document the immediate effects (first five years) of constructing roads in this area (Lower Salmon EA p.11)."

In evaluating the alternatives with respect to water quality, the EA stated all of the development alternatives "would substantially change the potential for mass erosion and resulting sediment production and transport, because the roads by necessity would be constructed over and through mass wasted landforms (Lower Salmon EA p.18)." The single largest risk from the project was considered to be the connector road from this area to Smith Ridge Road #700; the connector road was part of the preferred alternative. The risk of watershed degradation from all of the development alternatives was considered to be high. Concerning recovery of fish productivity impacted by past natural events, the EA stated that all development alternatives would delay flushing out of sediment, although none would significantly degrade habitat or productivity beyond its presently degraded state. The "No Action" alternative would have allowed the streams to continue recovering from past sediment loads with trends toward improvement of watershed stability and fishery productivity.

Comments on the EA reveal coordination of the project with the NFMA forest plan. Designations, objectives, and standards of

management areas were discussed, primarily with respect to elk management.

Comments pertinent to water quality and fish included those of the forest fisheries biologist and of two departments of the State of Idaho. The fisheries biologist recommended an alternative other than the preferred alternative as better meeting the intent of management standards for fish and water quality and also suggested a 30-year stream recovery period as more accurate than the 15-year period in the EA (Espinosa 1984). This was the only operation considered in this study that had water- or fish-related comments from non-USFS organizations. The IDHW-DOE suggested an alternative other than the preferred alternative would better minimize water quality impacts (IDHW-DOE 1984). The IDFG had participated in the early scoping process of the sale, but had confined its early concerns to big game habitat. After the EA was released, IDFG also expressed skepticism of the ability to control sedimentation problems in the area and requested that maximum effort be made to minimize erosion (IDFG 1984).

In the Decision Notice/FONSI signed in 1984, the Forest Supervisor's finding was based on consideration of, among other things, "no degradation of watershed stability or fish productivity [and] a moderate, but reasonable management risk of water quality degradation (Bates 1984).

Included in this project were water quality issues other than nonpoint source that warrant brief mention. The log dump on

Dworshak Reservoir required a CWA 404 Dredge and Fill Permit from the Army Corps of Engineers. Processing of this permit entailed review by the Idaho State Department of Water Resources and review and recommendations by EPA. The permit issued in 1984 included provisions to minimize adverse impacts to water quality, fish, and other environmental values. Also, transport of equipment to the site and logs from the site involved some pollution risks from fuel spills and organic debris. Further, storage of logs in the reservoir before transport raised issues regarding water quality degradation from debris and breakdown of logs. Since these particular water quality aspects of the project are from infrequent USFS activities that involve problems other than the NPS control of interest here, no further discussion of them is included.

The public works road contract is the contract of concern here since only the road construction has been undertaken so far. (The timber sale has not yet been awarded.) Similar to the forest practices for timber harvest in the East Bruin Creek Contract, the forest practices for road construction are comprised of standard and specific provisions. The major provision regarding fish and water quality is Special Provision Standard 204 shown in Appendix H. This provision involves specific measures to control soil erosion and water pollution, measures such as drainage devices, sediment basins, riprap, and seeding. Activities are scheduled to minimize erosion at all times, particularly during wet conditions and at the end of the

construction season. Particular measures are included to minimize impacts to stream channels: for example, unless specifically authorized by the Engineer, construction of temporary culverts and operation of mechanized equipment in streams are forbidden. In addition to the road specifications portion of the contract, one special contract provision is also pertinent here. The Landscape Preservation provision reiterates minimization of erosion and prevention of siltation. It also prohibits discharge of harmful materials near rivers and operation of equipment in streams without prior approval from the Contracting Officer.

Several inspections by interdisciplinary teams occurred during road construction. At least three memoranda on those inspections have been filed. The first, by the forest hydrologist reported an inspection when the road had been cut about a mile into the project area from Salmon Ridge Road #700. The hydrologist noted that Best Management Practices had "tracked well through the planning-design-contract-implementation process (Patten 1986a)." But two practices had been observed that could impact water quality. First, culverts at water crossings were too short at some small tributaries to protect against sediment from sloughing soils caused by runoff, construction, and maintenance activities. The culverts met engineering specifications, but these specifications were written to maintain the integrity of the fill and, in this case, were ineffective in preventing sediment entry into streams. The hydrologist

recommended that the additional, needed length would depend on each site, but that five additional feet of pipe would significantly alleviate the problem. Second, slash-filter windrows were incorrectly constructed at some stream crossings. Apparently the finer material that acts as a sediment trap was not used. This practice was due to an oversight in the contract: it seems the contract merely called for placement of base logs and not the finer limbs and tops at all necessary sites. The hydrologist also cited a problem that had escaped all notice during planning. "Gravel pit development and operations are significant actual and potential sources of water pollution, but they do not seem to receive the same planning, engineering, and administrative consideration as other sources (Patten 1986a)."

In this case, waste material from the rock pit had been cast over the edge of the road. Much was perched on a steep slope and could be retrieved, but some had entered Salmon Creek damaging the water resources.

The second inspection report took place during construction of a major stream crossing, which was the focus of the inspection. This report, also by the hydrologist, noted effective trapping of work site drainage, less than expected accumulation of sediments from the initial stream diversion, no sediment evidence from other sources, and overall competent development and implementation of practices meant to protect the watershed (Patten 1986b).

The third report, by the forest geologist, summarized an

interdisciplinary team survey of a portion of proposed road. The report only concerned further design recommendations for construction through slump topography (Brown 1986).

One pertinent amendment to the contract occurred during this road construction. Instead of clearing slash by scattering, the road contractor requested use of windrows. The windrow clearing method was seen as a superior erosion control measure, since the windrows would serve as sediment traps.

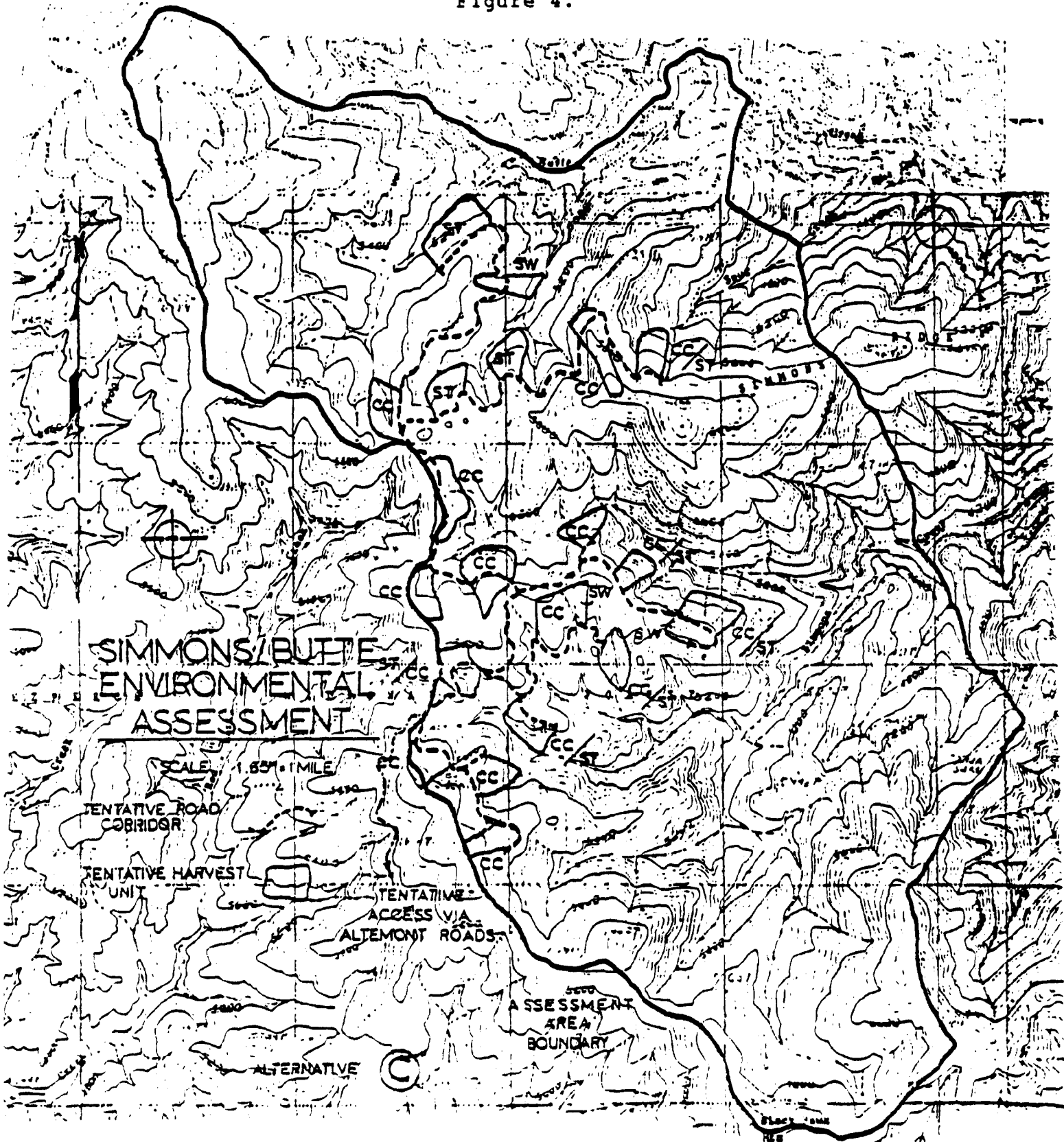
In an interview with the North Fork District Resource Assistant who prepared the EA for this project, it was learned that the district was very pleased with the overall road construction and the way the road contractor improved some aspects of the design to further minimize environmental impacts. While the USFS had planned on construction taking two field seasons, the contractor and his crew finished in one. Anytime partial construction over winter can be avoided, much degradation is avoided. District personnel hope that this construction work will serve as a standard for other projects (Anderson 1987).

Simmons/Butte Road, Nezperce National Forest.

This project area of 6,775 acres was located on the Elk City Ranger District. About two-thirds of the acreage was located in the Simmons Creek watershed and about one-third in the Butte Creek watershed (Figure 4). Both drainages were roadless before the present project. Both drainages suffered from wildfire damage at the turn of the century, but the streams had recovered to natural rates of sediment deposit by the time the project was proposed. Both creeks are tributaries to Meadow Creek, a significant tributary of the Selway River. The Selway River system is a major producer of chinook salmon, steelhead, and resident trout. Habitat for these fish exists in both Simmons Creek and Butte Creek.

Although this project was planned under the management direction of a 1967 multi-use plan and a 1973 timber management plan and road program, it was influenced by early drafts of the NFMA Plan, originally expected to be released during the same year as the EA. Feasibility Reports of 1980 added this area to the Five-Year Timber Sale Program recommending a 10 MMBF harvest from the Simmons Creek drainage and a 6-8 MMBF harvest from the Butte Creek drainage. Soils surveys, wildlife surveys, stand examinations, and a viewshed analysis were conducted during 1981. Fairly extensive solicitation for public input also took place in 1981: the four comments received were used along with interdisciplinary team concerns to develop alternatives for the EA.

Figure 4.



The EA was released in 1982. Major concerns were timber, water quality and fisheries, wildlife, and aesthetics. The preferred alternative was developed to ensure maintenance of anadromous fish production at 90% of potential. This standard set a threshold limit of 30% increase in sediment production. This limitation, in turn, set the maximum amount of road construction at ten miles with a timber harvest of 7 MMBF. This method of alternative development illustrates the interdisciplinary team's intent to consider "sediment levels and fisheries impacts as a limiting factor to development rather than only as an environmental consequence (Simmons/Butte EA p.17)." It was estimated that 10 - 15% of the riparian zone within the project area would be adjacent to or within harvesting units. However, "[b]rush growing adjacent the stream and the dilution effect of subterranean water flow and feeder streams would result in no significant increase in stream temperature even if the 15% of the riparian zone acreage were to be clearcut (Simmons/Butte EA p.14). The EA depended on standard contract language to alleviate impacts from soil compaction due to machinery, since standard contract language restricts equipment operation within 100 feet of streams. Although the EA cited operations occurring in and planned for other drainages of Meadow Creek, it did not address potential cumulative effects from the various activities.

The current 'state-of-the-art' is not accurate enough to calculate the combined impacts of sales in different prescription watersheds on an entire river system. ... [E]ach sale is designed to fall within Forest guidelines in terms of sediment delivered to a 'key reach.' ... This procedure is based on the premise that protecting each tributary from adverse impacts also protects the main stream. Also, since Meadow Creek above the confluence with Simmons and Butte Creeks has seven to eight times the volume of water as the combined volumes of Simmons and Butte Creeks, a substantial dilution of sediment reaching Meadow Creek would occur a short distance downstream (Simmons/Butte EA p.5).

The road contract was awarded in 1984. The pertinent contract provisions were the same as those for Lower Salmon except for the specific scheduling of Table 204.01 (Appendix H).

The road leading to the project area was completed in 1986, but construction of roads within the unit was postponed. According to the fisheries biologist for the forest, comments received by environmentalists following release of the proposed forest plan led to delaying entrance into this unroaded area for another ten years (Stowell 1987).

The Meadow Creek planning unit has long been an area over which much controversy has occurred. Therefore, fisheries biologists began collecting baseline data on fisheries and habitat in 1982 and 1983. The 1986 connector road was constructed primarily in the South Fork Clearwater drainage: only about a half-mile of construction took place within the Meadow Creek drainage, and that half-mile was about 2000 feet above Meadow Creek. Some sediment was put into the system, but, according to the fisheries biologist, the forest plan assumed that sediment would never be detected in Meadow Creek itself. To

test this assumption and to collect further baseline data for future entries into the area, fisheries biologists surveyed Meadow Creek again in 1987. Comparison of fish densities is given in Table 2.

TABLE 2.
COMPARISON OF 1982, 1983, AND 1987 FISH DENSITIES IN MEADOW CREEK
Number/M2

| Species/Age | 1982 | 1983 | 1987 |
|-----------------|------|------|------|
| Steelhead | | | |
| Fry | 0 | 0 | .023 |
| 0+ | .05 | .05 | .05 |
| 1+ | .16 | .14 | .18 |
| 2+ | .09 | .05 | .12 |
| Chinook | | | |
| Fry | 0 | 0 | 0 |
| 0+ | .01 | 0 | .01 |
| 1+ | .001 | .001 | .008 |
| 2+ | 0 | 0 | .01 |
| Cutthroat (All) | .005 | .003 | .003 |

From this data was concluded, "Steelhead densities remained virtually unchanged in the 0+ and 1+ age classes and increased in the 2+ age class. (Chinook densities showed minor fluctuations in all age groups.) It should be noted that 4 2+ chinook were observed. Cutthroat trout densities remained fairly constant (Stowell 1987b)." Fish habitat surveys have yet to be analyzed. Plans are to continue surveying the area.

AGREEMENT THROUGHOUT THE PROCESS

The lack of documented monitoring prevents proper assessment of compliance of implementation with planning. Furthermore, interviews with interested parties shed little light on this compliance issue. Some USFS personnel feel that operations are generally implemented as planned; others feel actual practices frequently vary from those planned. All USFS personnel questioned feel impacts are fairly well predicted during the planning process. Several outside agencies and citizens' organizations feel that implementation of activities on the National Forests generally complies with planning. However, involvement of outside groups during planning is very limited, and these same groups feel that more documented evaluation of operations is absolutely necessary to assure that implementation does comply with plans.

The three operations considered here show overall agreement throughout the planning/implementation process. However, as others have observed, the dependability of this assessment is very limited since so little documented evaluation is available.

EA Compliance With Forest-wide NFMA Plan.

Neither the East Bruin Timber Sale EA nor the Simmons/Butte Road Construction EA were written with the intent to comply with early drafts of forest plans. Also, neither contains adequate descriptions of management requirements and mitigation measures to compare with forest plan directives. Therefore, this comparison can apply only to the Lower Salmon EA. As far as I can tell, this EA largely complies with the forest plan's specified goals, objectives, and standards for water quality and related uses, with one major exception. The EA requires management of the fish habitat in the project area at "high fishable" levels of productivity. The Clearwater Forest Plan defines "high fishable" as follows:

Maximum short-term reduction of water quality that is still likely to maintain a fish habitat potential that can support an excellent fishery relative to the stream system's natural potential, and that will provide the capability for essentially full habitat recovery over time.

Maximum short-term sediment loading that is not likely to cause more than a 20 percent reduction from full biological potential of the habitat for the appropriate fish indicator species. Threshold levels of sediment should not be exceeded for more than 10 out of 30 years.

The approximate maximum sediment loadings that generally support this criteria are [55% over natural sediment loadings for streams such as Lower Salmon] (CNF Plan p.K-3).

This high fishable standard seems to preclude any activity in the area, since sediment levels already exceed the allowable increase and, apparently, will continue to do so for more than ten years of the next thirty. This conclusion is based on a watershed analysis statement in the EA: "Sediment impacts in the early

1970's (sic) may have reached 500 percent increase over natural levels. Under these conditions, the watershed would not return to natural conditions for another 25 to 30 years (Lower Salmon EA p.24)."

The only other exception may be the following plan objective: "During further analysis (project or area analysis) specifically define and map riparian areas (CNF Plan p.II-7)." I found no maps specifically delineating riparian areas. However, because this is an on-going project, I did not have access to all the working materials.

Besides compliance with the Plan per se, the Lower Salmon operation raises the question of compliance with the statutory intent of NFMA itself. NFMA requires that timber be harvested only where "soil, slope, or other watershed conditions will not be irreversibly damaged (16 U.S.C. § 1604(g)(3)(E)(i))." Throughout the planning stages of this project, however, much skepticism was voiced regarding stability of soils and the high potential for mass-wasting. It is unclear how these concerns and statutory requirement were reconciled with the decision to go ahead with the project. The only decision criterion documented in the files at the Supervisor's Office was the Supervisor's finding of "no [expected] degradation of watershed stability (Bates 1984)."

Contract Agreement with EA.

Because the East Bruin Creek EA was so vague with respect to water quality measures, the lack of any water quality protection provisions in the contract would have conformed to the intent expressed in the EA. As it was, the contract contained many provisions addressing water quality and erosion control, probably the same provisions as would have been included for a project with a more detailed EA.

The Simmons/Butte EA was similarly lacking in specific direction for fish and water quality protection. The only requirement was for the standard contract language of restricted equipment use within 100 feet of streams. On the other hand, the Lower Salmon EA contained numerous management requirements to mitigate effects on fish and water quality.

Despite these differences in EA preparation, the road construction contracts for the two projects contained essentially the same provisions for soil erosion and water quality. This suggests that the EA is not intended to direct further planning or specific practices. Rather, it seems to serve the function of identifying broad issues, identification of which automatically triggers inclusion of standard contract language.

Whether the Lower Salmon contract embodied all of the "directives" of the EA is unclear. Many of the EA measures primarily applied to harvest techniques, many were too vague to assess uniformity, and many required evaluation after the operation to determine if the contract provisions actually met

the directive. Of the EA measures that readily correlate with the road contract provisions, two demonstrated some inconsistencies between the EA and the contract. First, the EA required that "roads be brought to final grade, have final drainage installed, and have stream crossings surfaced with gravel and the slash windrow filters in place within the season pioneered (Lower Salmon EA p.8)." The contract allowed 1320 linear feet of unfinished road without drainage after the season ends. However, the contract did require that all surfacing at stream crossings be in place by the end of the season. Second, the EA required that "stream crossings ... be given special design emphasis ... to satisfy fish habitat and watershed requirements (Lower Salmon EA p.8)." According to the hydrologist's report discussed above, the length of culverts called for in the contract was too short to adequately protect streams from sediment, and windrows at some stream crossings were not adequately delineated in the contract. Although these are the only obvious inconsistencies, the contract overall does not particularly seem to be tied to the EA. Except for scheduling, the contract practices are preformulated. For that matter, the management requirements for fish and water resources in the EA would easily apply to any other project with a significant salmonid fishery, road construction, and unstable soils, as long as the other stream names were substituted. As such, it seems a better job could be done of matching the canned language if the EA is supposed to provide direction for ground operations.

Implementation Agreement with Pre-Contract Planning Documents.

Planning documents for the East Bruin Sale recommended several measures to protect fish and water resources. First, the wildlife biologist, the fisheries biologist, and the EA all recommended collection of K-V funds for stream cleanup. This measure became part of the SAI Plan, and K-V funds were used to remove numerous barriers in the 1987 field season with good results (Okula 1987). Second, the EA recommended incorporating the biologist's provisions, one of which was riparian zone harvesting. This recommendation was not carried out because the timber was not merchantable. Instead, the logs were removed during the stream cleanup in the 1987 field season (Sheridan 1987). Third, the biologists recommended use of K-V funds for habitat improvement and correction of the road culvert block at the mouth of Bruin Creek. Neither of these measures were included in the SAI plan, and no K-V funds were used to carry out these improvements. The district wildlife biologist was unaware that this important St. Joe cutthroat habitat was blocked by the road culvert. He felt that if the culvert did indeed block Bruin Creek, it was a major problem that should be remedied, although K-V funds would likely be inadequate for such an undertaking (Okula 1987). The Panhandle Plan lists Bruin Creek as completely blocked by a correctable barrier (IPNF Plan p.P-5).

In addition, the East Bruin EA predicted low surface erosion potential, low to moderate road prism erosion hazard, stable road conditions, and low water yield increase from the harvest. The

outcome of these predicted impacts has not been documented.

The only available evaluation of implementation of the Simmons/Butte operation is the fish survey of Meadow Creek. According to the fisheries biologist, forest personnel predicted no discernible impact on fish and fish habitat in Meadow Creek (Stowell 1987a). To date, this prediction has held true for fish densities (Stowell 1987b).

The only information on implementation of the Lower Salmon project comes from the hydrologist's reports on monitoring during construction and from an interview with the district resource assistant. Both sources indicate agreement between planning and implementation as well as impressive construction work overall with respect to mitigating effects on the environment. The only exceptions were the specific practices that should have been covered by the contract. These were discussed under contract agreement with EA. The district resource assistant is presently under the impression that all problems identified in these reports were resolved and sufficient mitigation of impacts on fish and water quality was achieved (Anderson 1987).

The planning materials for the Lower Salmon project also predicted "no degradation of watershed stability or fish productivity (Bates 1984)" and maintenance of "high fishable" streams. Whether these predictions will be realized will not be known until further monitoring and evaluation is conducted.

Implementation Agreement with Contract.

The only documented information available indicates fairly thorough agreement between contract and implementation with respect to fish and water quality measures. If it can be presumed that the daily diary and timber sale inspections for the East Bruin Creek Sale reported any inconsistencies, then few inconsistencies were observed by those administering the sale. Of those inconsistencies reported, lack of waterbars and malfunctioning drainage ditch, later inspection forms did not report correction except for one area needing waterbars. Therefore, we can only assume all problems were corrected before the final inspection.

From the file materials available, there was no indication of inconsistencies between contracts and implementation of the Simmons/Butte and Lower Salmon construction projects. Those problems on the Lower Salmon Road Constuction identified by the hydrologist were not inconsistencies between implementation and contract, but were instead a lack of certain mitigation measures in the contract. The one major difference between construction and original contract requirements went through contract revision and was considered an improvement in sedimentation control.

PROBLEMS WITH THE GENERAL PROCESS

Specificity of Environmental Assessments.

As noted in the introduction, this study grew out of a concern by several agencies over the USFS claim that more specific measures for water quality protection could not be included in forest-wide plans but were included in operation-specific EAs. In their comments on the proposed forest plans, these agencies requested more specific information on present fish densities and habitat, potential habitat, present water quality other than fish habitat, present soils data, past activities, land topography, stability of landforms, source and reliability of data, site-specific activities, and site-specific standards and practices. Thus, whether the EAs are indeed more specific is worth reviewing. If the three documents studied here are indicative of EAs generally, EAs are more specific insofar as they relate measures to specific streams and watersheds, but they are frequently not specific enough for publics to comprehend proposed activities, mitigation measures, and predicted impacts.

The East Bruin Creek EA was woefully inadequate in its site-specific discussion of fish and water quality issues. This EA contains no mention of present fish species, present fish densities, or present fish habitat. It contains no estimate of potential fish habitat, no indication of riparian zone conditions or special management for these areas. Anticipated changes in water yield are addressed, but not changes in water quality.

While it does present dominant landtypes, it does not describe slopes or soil conditions. It predicts low surface erosion potential, but does not present how this prediction was determined or the reliability of the data leading to this prediction. It does not discuss any possibilities of mass-wasting. It does not state how many miles of old logging roads must be reopened and reconstructed to permit the proposed harvest. It states that past harvests have occurred in the drainage and have damaged the creek conditions, but it does not give details on past activities or their impacts. It does not present where logging units will be located, which roads will be used, or how many stream crossings will be involved: it merely circles out an area and declares a harvest will take place using existing roads for access. It does not include any site-specific standards or practices to protect fish and water resources. The only mention of measures to mitigate impacts on water resources is collection of K-V funds for stream cleanup to minimize water yield increases. (Even this measure is later justified in terms of timber harvest: "Stream cleanout of Bruin Creek should improve the channel stability enough to permit an allowable water yield increase of 12% rather than 8% for future timber sales (East Bruin EA p. 5).") On the other hand, the Panhandle Plan contains dozens of measures (however general) regarding water resources, none of which were part of the project EA.

The EA is also woefully inadequate as a document from which to choose an environmentally sound alternative and to decide that

no significant environmental impacts will occur. No decision criteria were listed for fish and water quality values; the only decision criterion for watershed was expected water yield increase.

This EA appears to have been written essentially for in-house review, not for public participation. The clearest example of this is reference to, without enumeration of, the wildlife biologist's recommendations that should be incorporated in sale plans where feasible. This type of statement is of no value to interested publics and appears to have been of little value to in-house planners: the recommendations that were not explicitly listed in the EA itself were never included in the sale plans.

The Simmons/Butte EA also contains far fewer mitigation measures than the Nezperce forest-wide plan. However, this EA does present specific information on present fish species, present fish habitat, and potential fish habitat; information on what data were lacking and how values were estimated to overcome this void; information on presence of riparian areas and unstable areas; and information on impacts to fish resources, including some description of methods used to assess impacts.

For these two earlier operations, then, the project EAs were not more specific than the forest-wide plans with respect to standards and mitigation measures to protect fish and water quality. The Simmons/Butte EA was more specific with respect to describing many of the present conditions and potential impacts.

The Lower Salmon EA is even more comprehensive than the

Simmons/Butte EA in its description of soils and fish and water resources. In addition, it is the only EA of the three that contains numerous measures particularly aimed at managing for water resources. Some of these provisions are essentially a rewording of measures in the forest plan. This rewording is seen in the following comparison of measures in the Clearwater Forest Plan with the Lower Salmon EA.

The minimum coordinating requirements for projects on land types with high or very high mass stability or parent material erosion hazard ratings are: (1) The field verification of the mapped unit and predicted hazard rating. (2) Review road locations using a team consisting of a engineering geologist, hydrologist, soil scientist, and a silviculturist (3) After the "P" line has been located, stake mitigating road designs, using the original ID team members and road designer (CNF Plan p.II-33).

Control the location, design, timing of construction ... by requiring at a minimum that: a. road locations be approved after review and consultation with geologists, soil scientists, hydrologists, logging engineers, road engineers, etc., b. a "plan-in-hand" review of the final designs be conducted with involvement of soils, geology, and watershed specialists at a minimum (Lower Salmon EA p.7).

Other provisions in the EA were essentially the same as those in the forest plan, except for inclusion of specific sites in the former. The following provisions demonstrate this degree of specificity:

Secure favorable conditions of flow by maintaining the integrity and equilibrium of all stream systems in the Forest (CNF Plan p.II-27).

Manage the activities within the Salmon, Syringa, the unnamed streams, and Milk Creek systems to maintain favorable conditions of flow (i.e. watershed stability) (Lower Salmon EA p.10).

Some provisions of the EA, however, do indeed elaborate on

measures in the forest plan. Compare the following requirements:

Require that drainage structures and erosion control measures be installed on constructed and reconstructed roads prior to the normal wet season (CNF Plan p.III-71).

Control the location, design, timing of construction ... by requiring at a minimum that: ... roads be brought to final grade, have final drainage installed, and have stream crossings surfaced with gravel and the slash windrow filters in place within the season pioneered (Lower Salmon EA pp.7,8).

In addition to this comparison between forest-wide measures and "site-specific" measures, it should be noted that many measures contained in the EAs are rather vague and leave much room for interpretation. For example, the East Bruin EA requires, "limit reopening of old roads to the minimum necessary for logging (East Bruin EA p.1);" the Simmons/Butte EA requires treatment of slash "to reduce the [fire?] hazard to acceptable levels (Simmons/Butte EA p.7);" and the Lower Salmon EA requires "the use of ditches be minimized," "spot surfacing be used where effective in reducing erosion," and management of activities "to maintain favorable conditions of flow (Lower Salmon pp.8,10)." These "escape clauses" do not really require any level of compliance.

The Lower Salmon EA is clearly the most specific of the three EAs studied, both in terms of describing the present status of the project area and in terms of presenting general mitigating measures. For the most part, however, even the Lower Salmon EA does not contain very specific forest practices for mitigating anticipated impacts, nor very specific descriptions of proposed

activities and their impacts on the environment. As shown under the case studies above, the contract is the document that contains the specific forest practices that are to be followed during a particular activity. The design maps accompanying the contract contain the specific sites for activities. Some of the reasons practices and proposed activities are not specific in the EAs are (1) very little actual ground surveying has been done at the time the EA is written and (2) the EAs seem to be used more for identifying issues, concerns, and opportunities than for directing management of operations.

Therefore, examination of these three examples leads to the conclusion that review of EAs for specific projects will not provide agencies (such as EPA) an understanding of what specific practices will be followed during land- and water-disturbing activities. For that information, the contract must be consulted. However, project contracts are not subject to public review prior to adoption. As a consequence, to have significant input on specific practices, outside agencies should work with the Regional Offices for adoption of standard contract language in addition to periodically reviewing specific operations on individual forests.

It should also be pointed out that the NEPA document here is an EA, not a full-scale EIS, and, therefore, by its nature, is less detailed. But the fact that publics cannot obtain from these site-specific NEPA documents sufficient information to adequately assess the proposed action raises significant legal

issues on the compliance of this process with NEPA (issues that are, however, beyond the scope of this study).

Problems with Planning/Implementation/Monitoring.

During the course of this research, several potentially major problems with the process were noticed.

A) Planning.

The first deals with planning for protection of fish and water quality. It was suggested by USFS personnel and outside organizations that, with lack of baseline data, budget constraints, and resource conflicts likely to occur, fish and water quality are among the resources likely to receive lowest priority. The IDFG, in its comments on the Panhandle Proposed Forest Plan, for example, expressed concern that almost a decade would pass before baseline data for many fisheries resources parameters are gathered (IDFG Comments p.11). The proposed plan had set 1994 as the target date for accomplishment of fish habitat surveys, spawning site analyses, and lake surveys (IPNF Proposed Plan p.II-15). The final plan eliminated target dates altogether, requiring accomplishment, instead, as budgets allow (IPNF Plan p.II-16).

Furthermore, since more personnel, more influential personnel, and traditional USFS tendencies are inclined toward emphasizing timber management and road construction, resources such as fish and water quality are often neglected when resource conflicts arise during project planning (Espinosa 1987). This

problem of neglect is reflected in one of the case studies. The East Bruin Creek Sale, the most traditional of the operations considered, was very minimal in its planning treatment of resources, such as fish and water quality, that conflict with timber interests. However, such was not the case during the planning for the Lower Salmon and Simmons/Butte projects. To the contrary, fish and water quality concerns played a large role in decision-making during planning of the Simmons/Butte project. Whether neglect of fish and water quality is the more typical case is beyond the scope of this study. However, the fisheries biologists for all three forests indicated that adequate involvement of multiple resources personnel has occurred during planning. The shortcomings have been that these personnel only have time for the planning aspects of each project, not for monitoring and evaluation.

B) Implementation.

Another possible problem has to do with implementation. Concern was expressed by both USFS personnel and outside organizations that extensive multiple resource planning is for naught when activities are inspected only by engineers or foresters. It was indicated that day-to-day conflicts tend to be resolved in favor of timber or engineering concerns; that a traditional "good-old-boy" network exists between some administrators and some purchasers/contractors; and that those multiple resource personnel who were involved in planning projects are often not consulted when conflicts arise during

implementation. This study found that the mechanism is in place to avoid most of these concerns. Various personnel have only limited authority over different aspects of the project. Implementation of the East Bruin project indicated that specialists are consulted when problems arise. Both of the Timber Sale Administrators consulted the forest soils specialist when assessing the problems with the road slump in harvest unit 12. Whether the inspectors and administrators regularly ignore contract requirements and planning direction is unknown. No evidence of such was found for the operations considered here, but then, such activities, if they occur, would not likely be documented. Several USFS personnel indicated that districts vary in implementation (and planning, for that matter): some districts are not as concerned with fish and water quality as others. The same variation in implementation has often been raised by outside organizations with respect to the different forests.

C. Monitoring.

The greatest problem with the process is lack of monitoring. Even if inspectors and administrators do not consciously have a pro-timber bias in their resolution of conflicts, the fact remains that these personnel are trained foresters, forest technicians, or engineers, not aquatic biologists or hydrologists. To some degree, they undoubtedly make decisions that unconsciously favor timber because timber is what they know. More multi-disciplinary and interdisciplinary monitoring is needed. This study clearly demonstrates this need. There is

very little documented evaluation of how well operations have been conducted. And in some cases, there has even been very little observation of how well operations have been conducted. The Lower Salmon EA is the only one of the three studied that included any monitoring requirements; these were included because the district resource assistant, who prepared the EA, was particularly interested in evaluating the operation.

More monitoring and evaluation is required by the forest plans. Monitoring will be on a sampling basis with five-year reports evaluating problems and agreement between planned and implemented practices and between predicted and actual impacts. The Idaho Panhandle National Forests must undergo a big change to comply with these forest-wide plan requirements. Procedures for monitoring are now being developed (LeBrun 1987). The Clearwater and Nezperce National Forests are in a little better position, although neither has begun compliance with the actual monitoring programs in the forest plans. No increases in personnel are expected at any of these forests for monitoring and evaluation: all three forests hope to incorporate this new function into the present operating schemes.

The forest-wide monitoring programs were heavily criticized during the 1985 public review period for the proposed forest plans. For each of the forests of interest here, comments of IDHW-DOE summarized many of the criticisms. Regarding the proposed monitoring program, IDHW-DOE commented that the tabular program was a useful guide but could not be considered an

adequate monitoring plan in and of itself. The Department requested that detailed plans for water quality and fish be included in the final forest-wide plans (IDHW-DOE 1985b, 1985c, 1985d). However, only the final plan for the Nezperce National Forest included more specific monitoring information (Appendix E). The lack of specificity in the final plans for the Clearwater and Panhandle National Forests may have been due to a directive from the Region 1 Office. In a letter to the Regional Forester, IDHW-DOE referred to the new regional directive:

The essence of this direction is that the monitoring plans will be described by only a brief table as was used in the draft forest plans. The purpose of this direction is apparently to retain maximum flexibility by not committing to specifics in the plan. We believe this cursory treatment of monitoring would jeopardize the credibility of the forest plans and provides a very strong justification for appeal (IDHW-DOE 1987b).

Several programs to improve monitoring on the National Forests are also being developed independent of the forest-wide plans. First, IDHW-DOE has been revising its silvicultural management program. The draft includes more monitoring by the USFS to comply with the "feedback loop" concept incorporated in the State water quality standards in February 1987 whereby deficiencies in forest practices observed through monitoring will lead to improvements in BMPs (IDHW-DOE 1987a).

Second, the USFS has been developing a national strategy for implementation, effectiveness, and validation monitoring. Implementation monitoring is to determine whether plans and prescriptions are implemented as planned; effectiveness monitoring is to determine if plans and prescriptions achieve

objectives and standards; and validation monitoring is to determine if objectives and standards meet overall goals (Region 1 Monitoring Task Force 1987).

Third, the Region 1 Office of the USFS has been reviewing needs for more monitoring. A task force studying this issue with respect to fish and water quality recently released its findings that more monitoring is needed at several levels (Region 1 Monitoring Task Force 1987). At the administrative level, plans should be monitored by an interdisciplinary team to determine if (1) they comply with State BMPs, (2) they contain a monitoring plan that will adequately assess the effectiveness of BMPs, and (3) a mechanism is included to revise BMPs if necessary. Extensive field review should include (1) on-site monitoring by sale administrators, (2) tributary monitoring of first and second order streams to determine changes in stored sediment and channel geometry, and (3) main stream monitoring to measure changes in fish habitat and populations.

Despite the present emphasis on improving monitoring, some Forest Supervisors relegate monitoring to a low priority, a position that IDHW-DOE perceives "as a unfortunate trend being established in the regional offices (IDHW-DOE 1987b).

FURTHER RESEARCH

No claim is made that the operations studied here are representative of operations on the three forests. More research is needed to determine "normal" operating procedure. To obtain a representative sample, more operations should be studied, and the distribution between districts must depict the overall distribution of operations.

Furthermore, a similar study should be conducted at a later date. This project was in many ways premature to meet its objective. The forest planning process is constantly evolving. Very few forest operations were found for this study that had been planned recently enough to include NEMA policy and guidelines and, at the same time, had already been sufficiently implemented to compare planning and implementation. For some operations that met this criterion, the data that had been collected to compare predicted and actual impacts was incomplete and unanalyzed. Therefore, it is suggested that a similar study in two or three years would be more helpful than this study in assessing the consistency between planned and implemented forest practices and between predicted and actual impacts.

REFERENCES

- Anderson, K. 1987. Personal Communication with the North Fork District Resource Assistant, Clearwater National Forest, Orofino, Idaho (October 20, 1987).
- Bates, J.C. 1984. Decision Notice and Finding of No Significant Impact for the Lower Salmon Project, Canyon District, Clearwater National Forest, Orofino, Idaho.
- Bauer, S. 1987. Personal Communication with Silvicultural Nonpoint Source Specialist, Idaho Department of Health and Welfare-Division of Environment, Boise, Idaho (September 2, 1987).
- Bess, S.E. 1985. Timber Sale Inspection Report from Timber Sale Administrator for the East Bruin Project, Red Ives District, Idaho Panhandle National Forests, Coeur d'Alene, Idaho (October 30, 1987).
- Brown, T. 1986. Letter from the Forest Geologist to the Forest Road Development Engineer on the Lower Salmon Project, North Fork District, Clearwater National Forest, Orofino, Idaho (October 20, 1986).
- Card, L.B. & R.N. Flowers. 1982. North Zone Engineering Comments on the Lower Salmon Project, Canyon District, Clearwater National Forest, Orofino, Idaho.
- Clearwater National Forest. 1983. Transportation Plan for the Lower Salmon Project, Canyon District, Clearwater National Forest, Orofino, Idaho. (Cited as Lower Salmon TP.)
- Clearwater National Forest. 1984. Environmental Assessment for the Lower Salmon Project, Canyon District, Clearwater National Forest, Orofino, Idaho. (Cited as Lower Salmon EA.)
- Clearwater National Forest. 1987. Forest Plan, Clearwater National Forest, Orofino, Idaho (Cited as CNF Plan).
- Espinosa, A. 1982. Forest Fisheries Biologist's Comments on the Lower Salmon Project, Canyon District, Clearwater National Forest, Orofino, Idaho (March 10, 1982).
- Espinosa, A. ca. 1984. Forest Fisheries Biologist's Comments on the EA for the Lower Salmon Project, Canyon District, Clearwater National Forest, Orofino, Idaho.
- Espinosa, A. 1987. Personal Communication with Forest Fisheries Biologist, Clearwater National Forest, Orofino, Idaho (September 3, 1987).
- Faulkner, D. 1987. Personal Communication with Contract Specialist for Timber, Idaho Panhandle National Forests, Coeur d'Alene, Idaho (September, 22, 1987).
- Gale, L. 1982. In-file Comments on the Lower Salmon Project, Canyon District, Clearwater National Forest, Orofino, Idaho (March 11, 1982).
- Gertsch, R.M. 1981. Letter from Avery District Wildlife Biologist to Project File for East Bruin Project, Red Ives District, Idaho Panhandle National Forests, Coeur d'Alene, Idaho.
- Idaho Department of Fish and Game. 1984. Comments on EA for the Lower Salmon Project, Canyon District, Clearwater National

- Forest, Orofino, Idaho (July 9, 1984).
- Idaho Department of Fish and Game. 1985. Comments on the Proposed Forest Plan and Draft EIS for the Idaho Panhandle National Forests. Idaho Department of Fish and Game, Boise Idaho (No Date).
- Idaho Department of Health and Welfare-Division of Environment. 1984. Comments on EA for the Lower Salmon Project, Canyon District, Clearwater National Forest, Orofino, Idaho (June 5, 1984).
- Idaho Department of Health and Welfare-Division of Environment. 1985a. Silvicultural Nonpoint Source Task Force Final Report. Idaho Department of Health and Welfare-Division of Environment, Boise, Idaho.
- Idaho Department of Health and Welfare-Division of Environment. 1985b. Comments on the Proposed Forest Plan and Draft EIS for the Nezperce National Forest. Idaho Department of Health and Welfare-Division of Environment, Boise, Idaho (July 12, 1985).
- Idaho Department of Health and Welfare-Division of Environment. 1985c. Comments on the Proposed Forest Plan and Draft EIS for the Idaho Panhandle National Forests. Idaho Department of Health and Welfare-Division of Environment, Boise, Idaho (August 19, 1985).
- Idaho Department of Health and Welfare-Division of Environment. 1985d. Comments on the Proposed Forest Plan and Draft EIS for the Clearwater National Forest. Idaho Department of Health and Welfare-Division of Environment, Boise, Idaho (August 30, 1985).
- Idaho Department of Health and Welfare-Division of Environment. 1987a. Draft--State of Idaho Forest Practices Water Quality Management Plan. Idaho Department of Health and Welfare-Division of Environment, Boise, Idaho (March 1 1987).
- Idaho Department of Health and Welfare-Division of Environment. 1987b. Letter to James C. Overbay, Regional Forester, Region 1. Idaho Department of Health and Welfare-Division of Environment, Boise, Idaho (June 15, 1987).
- Idaho Panhandle National Forests. 1982a. Environmental Assessment of East Bruin Project, Red Ives Ranger District, Idaho Panhandle National Forests, Coeur d'Alene, Idaho. (Cited as East Bruin EA.)
- Idaho Panhandle National Forests. 1982b. Silvicultural Prescription for Unit 1, East Bruin Project, Red Ives District, Idaho Panhandle National Forests, Coeur d'Alene, Idaho.
- Idaho Panhandle National Forests. 1984. Contract for East Bruin Project, Red Ives District, Idaho Panhandle National Forests, Coeur d'Alene, Idaho.
- Idaho Panhandle National Forests. 1985. Proposed Forest Plan, Idaho Panhandle National Forests, Coeur d'Alene, Idaho. (Cited as IPNF Proposed Plan.)
- Idaho Panhandle National Forests. 1987. Forest Plan, Idaho Panhandle National Forests, Coeur d'Alene, Idaho. (Cited as

- IPNF Plan.)
- Kizer, R.D. 1982. Letter from Forest Supervisor to District Ranger for Red Ives District, Idaho Panhandle National Forests, Coeur d'Alene, Idaho (May 10, 1982).
- Kuested, F.R. 1982. In-file Comments on the Lower Salmon Project, Canyon District, Clearwater National Forest, Orofino, Idaho (March 16, 1982).
- LeBrun, P. 1987. Personal Communication with Planner, Idaho Panhandle National Forests, Coeur d'Alene, Idaho (October 8, 1987).
- Nezperce National Forest. 1982. Environmental Assessment for the Simmons/Butte Project, Elk City District, Nezperce National Forest, Grangeville, Idaho.
- Nezperce National Forest. 1987. Forest Plan, Nezperce National Forest, Grangeville, Idaho. (Cited as NPNF Plan.)
- Niehoff, J. 1985. Letter from Forest Soils Scientist to Forest Supervisor, Idaho Panhandle National Forests, Coeur d'Alene, Idaho (October 31, 1985).
- Okula, J. 1987. Personal Communication with the Avery District Wildlife Biologist, Idaho Panhandle National Forests, Coeur d'Alene, Idaho (October 29, 1987).
- Patten, R. 1982. Forest Hydrologist's Comments on the Lower Salmon Project, Canyon District, Clearwater National Forest, Orofino, Idaho (March 11, 1982).
- Patten, R. 1982. Letter from Forest Hydrologist to Canyon District Ranger, Clearwater National Forest, Orofino, Idaho (October 27, 1982).
- Patten, R. 1986a. Letter from the Forest Hydrologist to the North Fork District Ranger on the Lower Salmon Project, North Fork District, Clearwater National Forest, Orofino, Idaho (June 6, 1986).
- Patten, R. 1986b. Letter from the Forest Hydrologist to the North Fork District Ranger on the Lower Salmon Project, North Fork District, Clearwater National Forest, Orofino, Idaho (July 11, 1986).
- Region 1 Monitoring Task Force. 1987. Review Draft--Timber Management/Sediment/Fish Issue: Monitoring Needs and Guidelines. Monitoring Task Force, Region 1, Missoula, Montana (October, 1987).
- Sheridan, P.R. 1985a. Timber Sale Inspection Report from Timber Sale Administrator for the East Bruin Project, Red Ives District, Idaho Panhandle National Forests, Coeur d'Alene, Idaho (July 2, 1985).
- Sheridan, P.R. 1985b. Timber Sale Inspection Report from Timber Sale Inspector for the East Bruin Project, Red Ives District, Idaho Panhandle National Forests, Coeur d'Alene, Idaho (July 18, 1985).
- Sheridan, P.R. 1987. Personal Communication with the Timber Sale Administrator for the East Bruin Timber Sale, Avery District, Idaho Panhandle National Forests, Coeur d'Alene, Idaho (November 20, 1987).
- Stowell, R. 1987a. Personal Communication with the Forest

- Fisheries Biologist, Nezperce National Forest, Grangeville, Idaho (November 7, 1987).
- Stowell, R. 1987b. Biologists' Report on 1987 Meadow Creek Fish Survey, Nezperce National Forest, Grangeville, Idaho.
- Wilson, D. 1982. In-file Comments on the Lower Salmon Project, Canyon District, Clearwater National Forest, Orofino, Idaho (March 10, 1982).
- Wise, S.B. ca. 1982. Comments of the Forest Fisheries Biologist on the EA for the East Bruin Project, Red Ives District, Idaho Panhandle National Forests, Coeur d'Alene, Idaho.

APPENDIX A

FOREST-WIDE GOALS AND OBJECTIVES FOR FISH AND WATER QUALITY

In addition to the specific fish and water quality goals and objectives listed here, the forest plans contain goals and objectives for wild and scenic rivers, wetlands, floodplains and other resources that relate to water quality.

For the Clearwater National Forest, goals are as follows:

- 7. Fisheries
Manage the Forest's fishery streams to achieve optimum levels of fish production by:
1) maintaining high quality habitat in existing high quality streams and, 2) rehabili-tating and improving degraded streams on certain developed portions of the Forest; and then maintaining the optimum levels.
- 10. Water Quality and Soil
 - a. Manage watersheds, soil resources, and streams to maintain high quality water that meets or exceeds State and Federal water quality standards, and to protect all beneficial uses of the water, which include fisheries, water-based recreation, and public water supplies.
 - b. Insure that soil productivity is maintained and no irreversible damage occurs to soil and water resources from Forest management activities.
- 12. Roads
Locate, design and manage Forest roads to meet resource objectives and public concerns, and to provide optimal soil and watershed protection.

. . . .

For the Clearwater National Forest, objectives are as follows:

- . . .
6. Wildlife and Fish
 - . . .
c. Restore selected, presently degraded fish habitat through habitat improvement projects designed to achieve stated objectives for particular streams by 1997.
- . . .
9. Water and Soil
 - a. Secure favorable conditions of flow by maintaining the integrity and equilibrium of stream systems of the Forest.
 - b. Develop watershed activity schedules for key watersheds.
 - . . .
d. Apply best management practices during forest Plan implementation to help ensure that Forest water quality goals will be met.
- 10. Riparian Areas
During further analysis (project or area analysis) specifically define and map riparian areas.
- . . .
12. Roads
 - a. Incorporate transportation planning into all project and area analysis to determine road construction/reconstruction needs, appropriate road standards, and mitigation measures needed to minimize adverse effects.
 - . . .
c. Implement a road management program that is responsive to resource protection needs, water quality goals, and public concerns.
- . . .

For the Nezperce National Forest, goals are as follows:

- . . .
2. Provide and maintain a diversity and quality of habitat that ensures a harvestable surplus of resident and anadromous game fish species.
- . . .
20. Maintain or enhance stream channel stability and favorable conditions for water flow.
- 21. Provide water of sufficient quality to meet or exceed Idaho State Water Quality Standards and local and downstream beneficial uses.
- 22. Protect or enhance riparian-dependent resources.
- . . .

For the Nezperce National Forest, objectives are as follows:

. . .

Soils

Soil productivity will be maintained and soil erosion will be minimized through the application of best-management practices, careful riparian area management, use of fish/water quality drainage objectives, and soil and water resource improvement projects. If soil productivity or erosion approach unacceptable levels, project design will be modified, more effective best-management practices will be utilized, or projects will be dropped or rescheduled.

Water

The current Idaho Water Quality Standards will be met or exceeded. This will be accomplished through fishery/water quality drainage objectives and resulting sediment budgets; careful riparian area management; application of best-management practices; and soil, water, and fishery resource improvement projects. These management objectives and activities will minimize soil erosion and any resulting stream sedimentation. Effectiveness of these drainage objectives, conservation practices, and improvement projects will be evaluated by water quality monitoring and fishery habitat surveys.

Stream channel stability and integrity will be maintained by limiting increases in water yields. Channel stability will be evaluated by stream inventories. Water needed for National Forest purposes will be secured by making appropriate filings and following State water-right procedures. Effects of small hydropower projects on water-related beneficial uses and channel stability will be evaluated on a case-by-case basis.

Riparian

Manage riparian areas to maintain and enhance their value for wildlife, fishery, aquatic habitats, and water quality through the application of riparian area standards for timber management, grazing, and recreation. Preferential treatment will be given to riparian-dependent species on those areas where conflicts with other resource uses may occur.

. . .

Fishery

Anadromous fish habitat potential will be increased to 87 percent, a 1-percent increase above the present level of 86 percent of habitat potential, through four measures: direct habitat improvement, soil and water resource improvement, use of fishery/water quality objectives for individual drainages, and maintenance of current high habitat levels in areas designated to remain roadless. These improvement measures will also benefit identified sensitive fish species (Chinook salmon, summer steelhead trout, bull trout, and westslope cutthroat trout) and other resident fish.

Emphasis will be placed on structural improvements and re-establishment of riparian vegetation in those areas degraded through past dredge mining. In addition, projects which address existing excess sediment in the habitat will be given priority. The effectiveness of these improvement practices and drainage objectives will be monitored using standardized fish habitat survey techniques.

. . .

For the Idaho Panhandle National Forests, goals are as follows:

- . . .
4. Manage to emphasize the uniqueness of the visual quality, water quality, wildlife, fisheries and recreation around Hayden, Priest, Pend Orielle and Coeur d'Alene Lakes.
- . . .
13. Manage fisheries habitat to provide a carrying capacity that will allow an increase in the Forest's trout population.
- . . .
18. Maintain high quality water to protect fisheries habitat, water based recreation, public water supplies, and be within state water quality standards.
- 19. Manage resource development to protect the integrity of the stream channel system.
- . . .

For the Idaho Panhandle National forests, objectives are as follows:

. . .

i. Riparian Areas

Riparian areas will be managed to feature dependent resources (fish; water quality, maintenance of natural channels, certain vegetation, and wildlife communities) while producing other resource outputs at levels compatible for the objective for dependent resources.

j. Fisheries

The Idaho Panhandle National Forests will be managed to maintain and improve fish habitat capacities in order to achieve cooperative goals with the State Fish and Game Department and to comply with state water quality standards. Sedimentation arising from land management activities will be managed so that in forest fisheries streams the objective is to maintain 80 percent of fry emergence success as measured from pristine conditions. Appendix I details the analysis process.

Fishery and timber riparian management activities will be coordinated in order to maximize the contribution of riparian vegetation to aquatic habitats. An annual program of direct habitat improvement work will be pursued. Several unroaded stream and river segments will be managed as low public access areas to maintain a diversity of fishing experiences on the Forest.

. . .

m. Soils

Management activities on Forest lands will not significantly impair the long-term productivity of the soil or produce unacceptable levels of sedimentation resulting from soil erosion. This will be accomplished using technical guides developed in conjunction with the soil survey and Best Management Practices necessary to protect soil productivity and minimize sedimentation.

n. Water

Management activities will comply with state water quality standards. This will be accomplished through the use of the Best Management Practices (Appendix S is available upon request). The outcome of these best management practices will be monitored to determine their effectiveness. Water quality that is below Forest standards will be improved through restoration projects (see soil objective) and through the scheduling of timber harvest and road building activities where appropriate.

Lands within public water systems, as identified on the Management Area Map, will be managed for multiple-uses within the water quality standards for public water supplies.

The application of appropriate conservation practices will ensure that the quality of individual water bodies will not be significantly affected by sediment production.

. . .

APPENDIX B

FOREST-WIDE STANDARDS FOR FISH AND WATER QUALITY

For the Clearwater National Forest, standards are as follows:

5. Wildlife and Fish

j. Cooperate with Idaho Fish and Game, Indian tribes, and other agencies in the management of wildlife and fish habitat.

k. The following wildlife and fish species have been selected as indicator species on the Clearwater National Forest:

Steelhead Trout

Chinook Salmon

Rainbow and Brook Trout (in some streams)

8. Water

- a. Secure favorable conditions of flow by maintaining the integrity and equilibrium of all stream systems in the Forest.
- b. Manage water quality and stream conditions to assure that National Forest management activities do not cause permanent or long-term damage to existing or specified beneficial uses. (See Appendix K, Section A.)
- c. Apply best management practices (BMP) to project activities to ensure water quality standards are met or are exceeded. (See Soil and Water Conservation Handbook in Forest Service Handbook 2509.22.)
- d. Manage all waters in the Forest under a basic standard. (See Appendix K, section B.) This standard will be supplemented where applicable by the standards in "e" or other criteria related to local uses or conditions.
- e. In addition to standard d., manage all watershed systems in the Forest that are considered important for the fishery resource (anadromous and resident fish) to meet standards 1. through 4. below (in descending order of quality): (See Appendix K, Section B.)
 - (1) No Effect - Applies to the Middle Fork of the Clearwater River (Forest boundary to the confluence of the Lochsa and Selway Rivers); the Lochsa River; White Sand Creek; Crooked Fork ; Brushy Fork (mouth to Spruce Creek); North Fork of the Clearwater River (low pool to Meadow Creek); Little North Fork Clearwater River; Kelly Creek; Weitas Creek (mouth to Windy Creek); Cayuse Creek (mouth to Howard Creek); Hungery Creek; and all the waters within wilderness.

- (2) High Fishable - Applies to most of the waters of the North Fork, Lochsa, and Powell Ranger Districts including most of the main tributaries of the North Fork of the Clearwater River, Little North Fork of the Clearwater River, Kelly Creek, Cayuse Creek, Weitas Creek, Middle Fork of the Clearwater River, Lochsa River, White Sand Creek, Brushy Fork, and Crooked Fork; the main tributaries of Weitas Creek and Lolo Creek and its main tributaries on the Pierce Ranger District; and Elk Creek above Deer Creek on the Palouse Ranger District.
 - (3) Moderate Fishable - Applies to some of the waters within the developed portion (roaded as of 1984) of the Canyon area of the North Fork Ranger District, including Beaver Creek; and to Middle Creek on the Pierce Ranger District.
 - (4) Low Fishable - Applies to some of the waters within the developed portion (roaded as of 1984) of the Pierce Ranger District including Orofino Creek, French Creek, and Orogrande Creek; but excluding Lolo Creek and its tributaries (Yoosa Creek and Eldorado Creek).
 - (5) Minimum Viable - Applies to most of the waters within the Palouse District including the mainstems of the Palouse River and the Potlatch River and their tributaries, except for the mainstem of Elk Creek above Deer Creek. (See item [2].)
- f. Monitor, analyze, and evaluate water quality within critical reaches of specified streams, which are generally third or fourth order streams with watersheds ranging from 4 to 40 square miles. A list of specific stream systems and their respective standards is in Appendix K, Section C. Unlisted streams will be evaluated at the area or project level, and additional criteria will be developed if appropriate, using public input.
- g. Design, schedule, and implement management practices at the project level that:
- (1) will maintain water quality and stream conditions that are not likely to cause sustained damage to the biological potential of the fish habitat.
 - (2) will not reduce fish habitat productivity in the short-term below the assigned standards;
 - (3) will maintain water quality in a condition that is not likely to inhibit recovery of the fish habitat for more than the stated duration (see Appendix K for these recovery periods); and
 - (4) will require a watershed cumulative effects feasibility analysis of projects involving significant vegetation removal, prior to including them on implementation schedules, to ensure that the project, considered with other activities, will not increase water yields or sediment beyond acceptable limits. Also require that this analysis identify any opportunities for mitigating adverse

effects on water-related beneficial uses, including capital investments for fish habitat or watershed improvement.

- h. Where standards e(1), e(3), e(4), and e(5) have been exceeded prior to January 1984, design further management activity to re-establish the pre-project water quality and stream conditions and any pre-project recovery trends within 5 years of the activity. No further National Forest activities will be initiated that would result in any additional delays (beyond the 5 year delay) until the criteria are met, unless:
1) additional delays are fully justified and documented with social or economic considerations; or 2) it is unlikely that the Forest can affect water quality or the achievement of the water quality objectives due to actions beyond its control (i.e., other ownership activities, natural disasters, etc.).
- i. In watersheds with significant mixed ownership, major mining impacts, etc. improvement will be done through cooperative management schedules worked out with the appropriate landowners under coordinated leadership by the State of Idaho. The Forest will cooperate with other owners in mitigation of adverse effects, at least to the extent that Forest management activities have caused these adverse effects.
- j. Eliminate the watershed restoration backlog by 2000.
- k. Conduct nonpoint source activities in accordance with applicable best management practices as referenced in Idaho Water Quality Standards and Wastewater Treatment Requirements; and in Soil and Water Conservation Handbook in the Forest Service Handbook 2509.22.
- l. Determine instream flow requirements and assure that the activities comply with Forest Plan goals and standards when proposed activities have a potential of significantly altering the water flow, quantity, timing, or flow duration (ie., hydropower development, major diversion or storage facilities, etc.).
- m. Develop prescriptions on a case-by-case basis to ensure desired multiple-use outputs while recognizing domestic water supply needs in public supply watersheds. Encourage users to provide adequate and appropriate water treatment. Do not rely on management practices to provide pure drinking water.
- n. Consider existing water quality/fish habitat conditions in the analysis of proposed Forest projects in areas of mixed Forest ownership on the Powell District in the Kelly Creek watershed. The cumulative effects of the proposed National Forest activities combined with existing water quality conditions will not exceed Forest Standards.

• • •

11. Soils

- a. Manage activities on lands with ash caps such that bulk densities on at least 85 percent of the area remain at or below 0.9 gram/cubic centimeter.
- b. Design resource management activities to maintain soil productivity and minimize erosion.
- c. The minimum coordinating requirements for projects on land types with high or very high mass stability or parent material erosion hazard ratings are:
 - (1) The field verification of the mapped unit and predicted hazard rating.
 - (2) Review road locations using a team consisting of a engineering geologist, hydrologist, soil scientist, and a silviculturist. Assess concerns and possible mitigation measures to determine if a geotechnical investigation is needed.
 - (3) After the "P" line has been located, stake mitigating road designs, using the original ID team members and road designer.
- d. Review silvicultural prescriptions and unit locations on land type 50 (old slumps) to determine whether vegetation removal (timber harvesting) may contribute to slope instability.
- e. Give special attention to compacted glacial tills in the Powell area. When projects are proposed in areas where compacted tills are known to occur or suspected to occur, an intensive soil map will be prepared and ground verified. Mitigation measures should be applied that will assure that water tables will not be raised or that subsurface water will not be converted to surface flows. Measures will also be applied to assure that soil erosion and resulting lowering of soil productivity will not occur.

• • •

For the Nezperce National Forest, standards are as follows:

Wildlife and Fish

3. Monitor population levels of all Management Indicator Species on the Forest. These include . . . westslope cutthroat trout, summer steelhead, and spring chinook. These species have been selected because (a) they are threatened and endangered; (b) they have special habitat needs that may be influenced significantly by planned management programs; (c) they are commonly hunted, fished, or trapped; (d) they are non-game species of special interest; or (e) their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality.
20. Use the "Guide for Predicting Salmonid Response to Sediment Yields in the Idaho Batholith Watersheds" to evaluate the attainment of fish habitat objectives.
21. Meet established fishery/water quality objectives for all prescription watersheds...
22. Schedule fishery habitat and watershed improvements in those streams where the existing fishery habitat potential is below the stated objective. Complete an analysis, during fiscal year 1988, that will provide more details on: (a) the problems with each stream that is currently below the stated objective; (b) the type of habitat or watershed improvement that is needed in each stream; and (c) which streams will receive improvements first.

. . .

Water

1. Apply State water quality standards and "Best Management Practices" to land-disturbing activities to ensure State water quality standards are met or exceeded. In Idaho, "Best Management Practices," as defined by State regulation or agreement between the State and Forest Service, include the "Idaho Forest Practices Rules," "Best Management Practices for Road Activities," and "Rules and Regulations and Minimum Standards For Stream Channel Alterations." These documents are appended to, and are part of, this Forest Plan and are available upon request (see Appendix L).

In the absence of established "Best Management Practices," activities will be conducted in a manner that demonstrates a knowledgeable and reasonable effort to minimize adverse water quality impacts.

2. Use the "Guide for Predicting Sediment Yields from Forested Watersheds" and "Forest Hydrology, Part II--Hydrologic Effects of Vegetation Manipulation" to compare alternative effects on sediment and water yields.

3. Evaluate site-specific water quality effects as part of project planning. Design control measures to ensure that projects will meet Forest water quality goals; projects that will not meet State water quality standards shall be redesigned, rescheduled, or dropped.
4. Perform a watershed cumulative effects feasibility analysis of projects involving significant vegetation removal, prior to including them on implementation schedules, to ensure that the project, considered with other activities, will not increase water yields or sediment beyond acceptable limits. Such analysis shall identify any opportunities for mitigating adverse effects on water-related beneficial uses, including capital investments for fish habitat or watershed improvement.
5. Evaluate and respond to applications for hydro-power, water diversion, water storage, and other water-related facilities on a case-by-case basis. Provide timely comments to the Federal Energy Regulatory Commission (FERC) or to the appropriate State agency. Recommendations to FERC or other agencies shall be based on Forestwide and management area goals as stated in this Forest Plan. Applicants may be required to use private consultants or their own personnel to make environmental evaluations needed by the Forest Service and/or State agencies. Close cooperation and coordination with other agencies will be sought where appropriate.
6. Issue no special use permits for construction of small hydro-power developments in the Salmon River Basin until FERC has completed its Cluster Impact Analysis Project.
7. Analyze all small hydro-power developments for individual and cumulative adverse impacts following FERC's Cluster Impact Analysis Project. In watersheds where Forest management activities also occur, adverse impacts that are compounded with increased sediment yields from Forest activities will be evaluated.
8. Meet established fishery/water quality objectives for all prescription watersheds as shown in Appendix A.

Soils

1. Evaluate the potential for soil displacement, compaction, puddling, mass wasting, and surface soil erosion for all ground-disturbing activities.
2. A minimum of 80 percent of an activity area shall not be detrimentally compacted, displaced, or puddled upon completion of activities. This direction does not apply to permanent recreation facilities and other permanent facilities such as system roads.
3. Maintain sufficient ground cover to minimize rill erosion and sloughing on road cut and fill slopes and sheet erosion on other activity areas.

Riparian Areas

1. Allow no management practices in riparian areas that will cause detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment that seriously and adversely affect water conditions and fish habitat.
2. Give preferential consideration to riparian-area-dependent resources in cases of unresolvable conflict (resources such as fish, certain wildlife, certain water-dependent vegetation, and water are totally dependent upon riparian areas).

Actions within or affecting riparian areas will include protection and, where applicable, improvement of riparian-dependent resources.

3. Effects on wetlands and floodplains must be considered for all alternatives during the environmental analysis process.
4. Delineate and evaluate riparian areas in project areas prior to implementing any project activity.
5. Manage riparian areas to maintain cover and security for riparian-dependent species with emphasis on maintaining and enhancing habitats for threatened and endangered species. Use "Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho" to evaluate the need for and to provide adequate hiding cover and security areas for big game. Biological evaluations, during site-specific project analysis, shall identify needs and recommendations.

• • •

Roads and Trails

• • •

6. Plan, design, and manage all access to meet land and resource management objectives, meet the State Water Quality Standards, and meet Best Management Practices (BMPs).
7. Plan to implement post-project activities, including access prescriptions, within two field seasons of the last planned land-disturbing activity. Minimize the total time that roads will be open for construction and timber harvest activities.
8. Minimize impacts from construction in identified key riparian and wildlife areas. Develop rehabilitation plans for existing access facilities that are producing significant impacts on riparian-dependent resources.
9. Design all proposed road systems to mitigate at least 60 percent of the sediment predicted. Utilize proven mitigation procedures in the design and construction of roads to meet up to 90 percent of the sediment predicted, where needed to meet resource management objectives.

• • •

For the Idaho Panhandle National Forests, standards are as follows:

. . .

Range

. . .

5. Riparian zone and stream bank standards, with periodic monitoring, will be specified in each allotment plan. The IPNF stream condition survey system (COWSED) will be used by 1990 on approximately 100 miles of fisheries streams within grazing allotments to develop the data for correcting stream bank problems.

. . .

Facilities

. . .

9. Provide fish passage to suitable habitat areas, by designing road crossings of streams to allow fish passage.

. . .

Fish

1. Activities on National Forest lands will be planned and executed to maintain existing water uses. Maintain is defined as "limiting effects from National Forest activities to maintain at least 80 percent of fry emergence success in identified fishery streams." The percent is measured from pristine conditions. Current methodology will not detect an impact of less than 20 percent. During the life of the plan, new technologies may permit more precise assessments; however, the goal of this standard will remain as "to maintain 80 percent of fry emergence success."

2. Streams providing spawning and rearing habitat, which are considered critical to the maintenance of river and lake populations of special concern, will be managed at a standard higher than the 80 percent standard. Monitoring will be needed to detect this higher standard. The high value streams are:

HIGH VALUE STREAMS

| | |
|----------------------------------|--|
| Upper Marble | Skookum |
| Catspur | Bird |
| Foehl | Eagle (Avery R.D.) |
| Lund | Quartz (Avery R.D.) |
| Canyon (Avery R.D.) | Johnson |
| Boundary | North Fork Hayden |
| South Fork Granite | East Fork Hayden |
| Blacktail (Priest Lake R.D.) | Granite (Sandpoint R.D.) |
| North Fork Granite (Priest Lake) | Gold (Sandpoint R.D.) |
| Trestle | North Gold (lower portion) |
| North Fork Grouse | Upper North Fork Coeur d'Alene (upstream of Iron Cr.) |
| Lightning (below falls) | |
| Beaver (Priest Lake R.D.) | Upper Simmons |
| Hughes Fork | Upper Cd'A (upstrm. of Spruce Marie Cr.) |
| Grass | Upper Wolf Lodge |
| Deer (Bonners Ferry R.D.) | Cougar |
| Upper Priest | West Fork, East Fork Steamboat |
| Upper Pack | Brown |
| Upper Grouse | Trail |
| East Fork Lightning | Upper Teepee (upstrm. of Trail Big Elk, Creek) |
| Porcupine | Savage |
| Wellington (below falls) | |
| Ratole | |
| Gold (Avery R.D.) | |

3. The stream and river segments listed below will be managed as low access fishing opportunities to maintain a diversity of fishing experiences for the public and to protect sensitive fish populations. Special road management provisions will be used to accomplish this objective.

LOW ACCESS FISHING STREAMS

| | |
|--|-----------------|
| LNF Clearwater River (downstream of Mowich Cr.) | Foehl Cr. |
| Canyon Cr (Avery R.D.) | Declaration Cr. |
| Sawtooth Cr. | Marie Cr. |
| Long Canyon Cr. | Blacktail Cr. |
| Upper Priest River ^{1/} | FW Slate Cr. |

^{1/} Presently closed to fishing by the State of Idaho.

LOW ACCESS FISHING STREAMS (Cont.)

| | |
|---------------------------------|------------------------|
| Upper Cœur d'Alene | Marble Cr. |
| (between Teepee & Martin) | (upstream of Hobo Cr.) |
| Independence Cr. | Clear Cr. |
| St. Joe River | Siwash Cr. |
| (Between Red Ives & Heller Cr.) | |
| Freezout Cr. | Black Prince Cr. |
| WF Big Cr. | Skookum Cr. |
| EF Big Cr. | MF Big Cr. |

4. Provide fish passage to suitable habitat areas, by designing road crossings of streams to allow fish passage or removing in-stream migration barriers.
5. Utilize data from stream, river, and lake inventories to prepare fishery prescriptions that coordinate fishery resource needs with other resource activities. Pursue fish habitat improvement projects to improve habitat carrying capacities on selected streams.
6. Coordinate management activities with water resource concerns as described in MA 16, Appendix I, and Appendix O.

1. Management activities on Forest lands will not significantly impair the long-term productivity of the water resource and ensure that state water quality standards will be met or exceeded.
2. Maintain concentrations of total sediment or chemical constituents within State standards.
3. Implement project level standards and guidelines for water quality contained in the Best Management Practices (Appendix S, available upon request), including those defined by State regulation or agreement between the State and Forest Service such as:
 - a. Idaho Forest Practices Rules
 - b. Rules and Regulations and Minimum Standards for Stream Channel Alterations
 - c. Best Management Practices for Road Activities.
4. Cooperate with the states to determine necessary instream flows for various uses. Instream flows should be maintained by acquiring water rights or reservations.
5. Manage public water system plans for multiple use by balancing present and future resources with public water supply needs. Project plans for activities in public water systems will be reviewed by the water users and the State.

Streams not defined as public water systems, but used by individuals for such purposes, will be managed to the standards stated below or to the fisheries standards whichever is applicable.

6. Activities within non-fishery drainages, including first and second order streams, will be planned and executed to maintain existing biota. Maintenance of existing biota will be defined as maintaining the physical integrity of these streams. Best Management Practices (Appendix S), Appendix O, and riparian guidelines will be used to accomplish this objective.
7. It is the intent of this plan that models be used as a tool to approximate the effects of National Forest activities on water quality values. The models will be used in conjunction with field data, monitoring results, continuing research and professional judgment, to further refine estimated effects and to make recommendations.

APPENDIX C

MANAGEMENT AREAS

Management Areas for the Clearwater National Forest:

- A2 - Elk Creek Falls Recreation Area
- A3 - Dispersed Recreation in Unroaded Setting
- A4 - Visual Travel Corridor
- A5 - Developed Recreation
- A6 - Historic/Visual Travel Corridor
- A7 - Wild and Scenic River
- B1 - Selway-Bitterroot Wilderness
- B2 - Recommended Wilderness
- C1 - Key Big-Game Summer Range
- C3 - Key Big-Game Winter Range/Unsuitable for Timber Mgt
- C4 - Key Big-Game Winter Range/Timber Management
- C6 - Key Fishery Habitat
- C8S - Big-Game Summer Range/Timber Management
- E1 - Timber Management
- E3 - Aerial Harvest Systems/Timber Management
- M1 - Research Natural Areas and Special Areas
- M2 - Riparian Areas.

Management Areas for the Nezperce National Forest:

- 1 - Dispersed Nonforest Lands
- 2 - Administration
- 3 - Cultural Preservation
- 4 - Mineral Exploration and Development
- 6 - Research Natural Areas
- 7 - Developed Recreation
- 8.1, 8.2, 8.3 - Wild and Scenic Rivers
- 9.1, 9.2, 9.3 - Wilderness Areas
- 10 - Riparian Zone
- 11 - Fisheries/Water Quality
- 12 - Timber Production
- 13 - Timber Production/Visual Quality Objectives (VQOs)
- 14 - Timber Production/VQOs/Deer and Elk Winter Range
- 15 - Timber Production/Deer and Elk Winter Range
- 16 - Deer and Elk Winter Range
- 17 - Timber Production/VQOs -- High to Medium Sensitivity
- 18 - Deer and Elk Winter Range/VQOs
- 19 - Livestock Forage
- 20 - Old-growth Habitat
- 21 - Moose Winter Range
- 22, 23 - Public Water Supplies

Management Areas on the Panhandle National Forests:

- 1 - Timber Production
- 2 - Timber Production/Grizzly Bear Habitat
- 3 - Timber Production/Grizzly Bear/Big Game Winter Range
- 4 - Timber Production/Big Game Winter Range
- 5 - Big Game Winter Range
- 6 - Timber Production/Elk Summer Range
- 7 - Caribou Management
- 9 - Lands Unsuitable for Timber Production
- 10 - Semi-primitive Recreation
- 11 - Wilderness Areas
- 12 - Wild and Scenic Rivers
- 13 - Special Management Areas (Scenic, Botanical, Historic)
- 14 - Research Natural Areas
- 15 - Unsuitable for Timber Production/Primary Range
- 16 - Riparian Zone
- 17 - Developed Recreation
- 18 - Administration
- 19 - Semi-primitive Recreation/Timber Production
- 20 - Unroaded Semi-primitive Recreation/Unroaded Timber

APPENDIX D

RIPARIAN MANAGEMENT AREAS

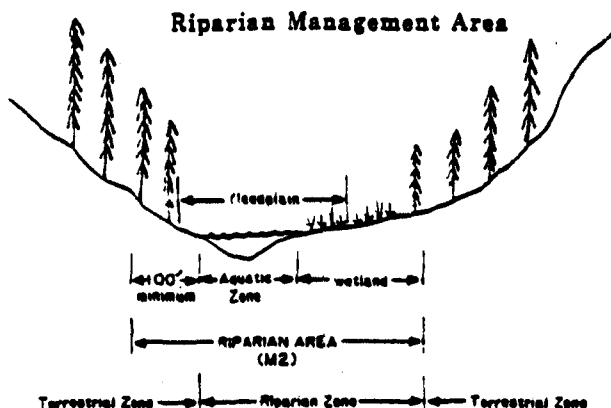
For the Clearwater National Forest:

MANAGEMENT AREA M2 (107,263 Acres)

A. DESCRIPTION

Riparian areas include all perennial water (streams and lakes), wetlands, floodplains, and by definition, the land within at least 100 feet of perennial water. Riparian areas include or directly influence the quality of riparian dependent resources (i.e., water resources, fish habitat, certain wildlife, recreation, etc.). The primary functions are:

- flood control and moderation
- water quality maintenance
- stream channel structural maintenance
- water temperature control
- fish habitat (spawning, rearing, food source)
- upslope sediment and water yield buffer
- wildlife habitat
- aquatic and riparian-type vegetation



The M2 Management Area consists of only those riparian areas in the Forest that are associated with E1, E3, C8S, C4, A4, A6, and C8S Management Areas which are suitable for timber management. Total available riparian acres associated with these management areas are 107,200 acres.

Riparian areas which exist within unsuitable Management Areas (B1, B2, A2, A3, C1, C3, C6 and M1) will be managed in accordance with the management direction for that management area.

Because of the large number and generally narrow width, they are not shown on the small scale Forest Plan map but will be delineated on the project maps as needed.

These narrow corridors should be considered an integral part of surrounding or adjacent lands.

B. GOALS

Manage under the principles of multiple use as areas of special consideration, distinctive values, and integrated with adjacent management areas to the extent that water and other riparian dependent resources are protected.

Evaluate onsite and cumulative effects of proposed action, resolving significant conflicts in favor of riparian dependent resources.

C. GOALS AND STANDARDS BY RESOURCE

The Forestwide management direction included in Chapter II applies to this management area.

1. Recreation

Goal

Manage settings for dispersed recreation commensurate with the settings of the surrounding or adjacent management area(s).

Standards

- a. Locate and establish recreational facilities on dry, well-drained areas, preferably on the periphery of the area.
- b. Manage areas seen from Management Areas A4, A5, and A6 to meet or exceed the adopted visual quality objectives shown in Appendix G.
- c. Protect characteristics of potential Wild and Scenic River corridors.
(See Appendix M.)

2. Wildlife and Fish

Goal

Remove structures (log jams, etc.) that are identified as fish barriers. Retain those that enhance habitat. Construct new structures to improve or restore degraded habitat.

Standard

Maintain streamside vegetation to provide adequate cover and habitat components for fish.

3. Range

Goals

- a. Manage range allotments to achieve stable soil and streambanks.
- b. Design grazing systems to promote recovery of degraded riparian vegetation.

- c. Discourage concentrated livestock use.

4. Timber

Goal

Use site preparation methods which maintain the sediment filtering function of duff and ground vegetation.

Standards

- a. Manage vegetation to:

- (1) Provide a diversity of vegetation for dependent wildlife species.
- (2) Maintain an overmature component for dependent wildlife species and for large woody debris recruitment as necessary for stream stability and fish habitat.
- (3) Maintain the buffering function of organic debris and vegetative cover such that landslides, potential water yields, and sediment delivery from upslope management activities are moderated.

- b. When utilizing regeneration harvests, use small, irregularly shaped, and widely spaced regeneration harvest units near streams.
- c. Restrict, or prohibit applications of approved chemicals that may be damaging to dependent resources.
- d. Specify the location and use period of temporary stream crossings to avoid high-risk areas and control sedimentation.
- e. Locate skid trails on margins or outside of riparian areas when possible. If not possible, designate skid trails and provide erosion control prior to the wet season. Require timely restoration.

5. Water and Soil

Goal

- a. Conduct watershed and stream improvements that will:

- (1) Enhance riparian and water resources.
- (2) Rehabilitate and/or mitigate the adverse effects of fire, flood, and other natural or management related causes.

Standard

Meet Forestwide water quality standards.

6. Minerals

Goal

Locate production facilities outside management area when possible to avoid impacts on riparian values.

Standard

Prohibit extraction or disposal of common variety minerals within the normal high water line of any perennial water body.

7. Lands

Goal

Permit special uses, including hydropower development, when they do not conflict with riparian-dependent resource objectives, or if conflicts can be resolved or adequately mitigated.

Standards

- a. Retain National Forest System Lands and consider acquisition of new lands when such actions can improve or better protect riparian and watershed values.
- b. Locate needed rights-of-ways, including utility corridors, on margins or outside of riparian areas where possible.

8. Facilities

Goal

Maintain trails to preserve riparian values.

Standards

- a. Require that drainage structures and erosion control measures be installed on constructed and reconstructed roads prior to the normal wet season.
- b. Avoid new road construction near or adjacent to streams except at specified crossings.
- c. Design mitigation measures that will effectively reduce sediment from road construction, use, and maintenance. (Typically at least 70 percent mitigation.)
- d. Design road fills, landings, tanker fills, etc., that will maintain the functions of the riparian areas, including flood moderation, and prevent direct resource damage.

- e. Design stream crossings for protection of water resource values such as fish passage, nonerosive velocities, channel stability, to avoid ponding and flooding, and to provide erosion control of road fills and surfaces.

9. Protection

Goals

- a. Use activity fuel and hazard reduction methods that minimize disturbance of aquatic ecosystem and allows native riparian vegetation to recover naturally.
- b. Utilize prescribed fire from unplanned ignitions as needed to achieve Forest Plan direction.

Standards

- a. Confine, contain, or control wildfires.
- b. Avoid use of heavy equipment for fire line construction.
- c. Apply erosion control measures as a part of fire control and line construction.
- d. Use prescribed fire from planned ignitions to treat activity fuel loadings.

D. SCHEDULE OF ANTICIPATED MANAGEMENT PRACTICES

The schedule of management area practices is not intended to act as a limit or target. Figures listed are projections and will be monitored to test for long-term application and achieving Forest Plan direction. The second decade figures are shown only for information about what would happen if the management direction of this Plan would continue in the second decade.

| Management Practice | Units | Average Annual | |
|----------------------------|-------|----------------|----------|
| | | Decade 1 | Decade 2 |
| Total Timber Sales | MMBF | 5.2 | 8.5 |
| | Acres | 3516.0 | 4938.0 |
| Compartment/Stand Exam | Acres | 10726.0 | 6436.0 |
| Reforestation | Acres | 1758.0 | 711.0 |
| Road Construction | Miles | 0 | 0 |
| Soil and Water Improvement | Acres | 86.5 | 86.5 |
| Fish Habitat Improvements | Acres | 219.0 | 219.0 |

E. MONITORING AND EVALUATION REQUIREMENTS

The monitoring requirements from Chapter IV that are applicable to this management area are shown in Table IV-2 in Chapter IV. The procedures outlined in Chapter IV will be followed to evaluate the data gathered during monitoring.

For the Nezperce National Forest:

Chapter III

Management Area Direction

MANAGEMENT AREA 10 (11,859 acres)

A. Description

Management Area 10 consists of lakes, lakeside lands, perennial streams, seasonally flowing streams supporting riparian vegetation, and adjoining lands that are dominated by riparian vegetation. The width of the components of this management area varies and is determined by the riparian vegetation and the valley bottom width. Riparian vegetation is vegetation requiring a high level of soil moisture. The area is often nearly flat and is subject to various degrees of flooding or saturation. As additional acres of riparian areas are identified and mapped during project planning, the acres in this management area will increase.

This area includes the floodplains of streams and the wetlands associated with springs, lakes, and ponds. The natural and beneficial values of riparian areas include groundwater recharge, moderation of flood peaks, maintenance of water quality, visual and recreational enjoyment, fish and wildlife habitat, cultural resources, and timber and forage production.

This management area contains inclusions of other management areas as shown below:

| Management Area | Inclusion Acres |
|-----------------|-----------------|
| 1 | 41 |
| 12 | 249 |
| 16 | 682 |
| 17 | 149 |
| 20 | 298 |
| 21 | 55 |

In addition to the 11,859 acres mapped for this management area, there are 10,214 acres of this management emphasis which occur as inclusions in other management areas.

B. Goals

Manage riparian areas to maintain and enhance their value for wildlife, fishery and aquatic habitat, and water quality. Manage timber, grazing, and recreation to give preferential consideration to riparian-dependent species on that portion of the management area "suitable" for timber management, grazing, or recreation.

The goal for summer elk habitat in this management area is to manage 1,615 acres to achieve at least 75 percent of habitat potential; 6,815 acres to achieve at least 50 percent of habitat potential; and 2,975 acres to achieve at least 25 percent of habitat potential. Specific methods of how to achieve this will be determined on a site-specific basis during project planning (see Appendix B).

C. Standards

| RESOURCE ELEMENT | STANDARDS |
|---|--|
| | <p>The Forestwide management direction included in Chapter II of this Plan applies to this management area.</p> <p>Consider cumulative impacts of proposed activities on the entire riparian ecosystem.</p> |
| RECREATION Dispersed Recreation | <ol style="list-style-type: none"> 1. Limit and distribute use as necessary to protect riparian areas. |
| RANGE Range Management | <ol style="list-style-type: none"> 1. Manage existing grazing to protect or enhance riparian-dependent resources. 2. Develop or improve range management plans for each allotment. 3. Maintain riparian habitat in good or better condition by developing intensive grazing systems and structural improvements, or by reductions in stock. |
| WILDLIFE AND FISH Habitat Management | <ol style="list-style-type: none"> 1. Maintain sufficient streamside vegetative canopy to ensure acceptable water temperatures for fish and to provide cover. 2. Management activities shall not be permitted to adversely change the composition and productivity of key riparian vegetation. Riparian areas now degraded by management should be rehabilitated before any further nondependent resource use of the immediate area is permitted. 3. Schedule habitat improvements in all drainages presently below stated objectives. Improvements will include in-stream structures, channel changes, and riparian revegetation. Use in-stream improvements and barrier removal to enhance those drainages where habitat capacity is undisturbed. 4. Maintain sufficient streamside vegetative structure, composition, and diversity for travel corridors between old-growth stands. |
| TIMBER Timber Harvest | <ol style="list-style-type: none"> 1. Lands are classified as "suitable" for timber management; schedule timber harvest. 2. Design timber harvest activities to protect or enhance riparian-dependent resources. Emphasize multi-layered stand conditions and a vegetative mosaic. 3. Locate timber harvest landings outside of riparian areas. 4. Require directional felling of trees away from stream courses. 5. Prohibit harvesting equipment that will result in significant ground disturbance. 6. Suspend logs completely when possible when crossing riparian areas. 7. Prohibit management activities that would change stream geomorphology by adversely altering streambanks, channel dimensions, or channel sediment. |

| RESOURCE ELEMENT | STANDARDS |
|---|--|
| WATER | 1. Meet established fishery/water quality objectives for all prescription watersheds as shown in Appendix A. |
| FACILITIES Roads and Trails Trails Utility Corridors | 1. Design mitigation measures to reduce sediment from roads constructed in riparian areas by at least 70 percent. 2. Minimize crossings in riparian areas. Cross streams at as near a right angle as practical. Construction parallel to streams (in riparian areas) should be avoided. Opportunities to remove roads and trails from riparian areas should be considered if they are producing significant impacts on riparian-dependent resources. 3. Motorized recreation vehicles (other than on-snow types) should generally not be allowed off of roads and trails in riparian areas. 4. Maintain trails to reduce environmental damage. Design reconstruction projects to mitigate sediment. 5. Manage area as a 'category 1 avoidance area.' |
| MINERALS Exploration and Development Stream Alteration or Diversion | 1. Recommend 'no surface occupancy' in mineral leases. 2. Address reestablishment of fish habitat in all reclamation plans where habitat may be damaged by proposed mineral exploration or development activities. 3. Require specific mitigation and reclamation measures which address stream bed and stream bank stabilization, proper location and construction of settling ponds, and timely reestablishment of riparian vegetation. |
| PROTECTION Insect and Disease Fire Management | 1. Apply integrated pest management to minimize losses and protect riparian area values. 2. Wildfire management strategies are control, contain, and confine. The specifics on implementation shall depend upon location, expected fire behavior, and values at risk. Decision criteria shall be specified in the Fire Management Action Plan. 3. Planned ignitions, when within prescription, will be allowed to burn to enhance resource values. |

D. Schedule of Management Practices

| Management Practice | Average Annual Units | Decade 1 | Decade 2 |
|-----------------------------|----------------------|----------|----------|
| Fish Habitat Improvement 1/ | Acres | 400 | 40 |
| Soil & Water Improvement 1/ | Acres | 160 | 25 |
| Timber Harvest | | | |
| Clearcut | MBF | 1,565 | 1,726 |
| | Acres | 50 | 55 |
| Shelterwood-Removal Cut | MBF | 60 | 60 |
| | Acres | 30 | 30 |
| Selection | MBF | 898 | 898 |
| | Acres | 100 | 100 |
| Salvage/Sanitation | MBF | 0 | 0 |
| | Acres | 0 | 0 |
| Total Timber Harvest | MBF | 2,523 | 2,684 |
| | Acres | 180 | 185 |
| Silviculture/Stand Exams | Acres | 2,600 | 2,600 |
| Timber Compartment Exams | Acres | 500 | 0 |
| Reforestation (KV) | Acres | 180 | 185 |
| Road Construction | Miles | 0.5 | 0.5 |
| Road Reconstruction | Miles | 0.5 | 0 |

1/ Includes structural habitat improvements.

E. Monitoring and Evaluation Requirements

The monitoring requirements from Chapter V that are applicable to Management Area 10 are: 1d, 1e, 1h, 1j, 2a, 2e, 2g, 2h, 2i, 2j, 2k, 4, 5, 6, 7, 10. The procedures outlined in Chapter V will be followed to evaluate the data gathered during monitoring.

For the Idaho Panhandle National Forests:

**Management Area 16
(52,500 acres)**

Description:

Areas with distinctive resource values and characteristics that are comprised of an aquatic ecosystem and adjacent upland areas that have direct relationships with the aquatic system. This includes floodplains, wetlands, and all areas within a horizontal distance of approximately 100 feet from the normal high water line of a stream channel or from the shoreline of a standing body of water.

This management area includes the important fisheries streams on the Idaho Panhandle National Forests. The area receives the highest concentrated recreation use on the Forest with most existing campground and undeveloped campsites within or adjacent to the area. The area represents a great diversity of vegetation from meadow lands to old-growth timber to stands of cottonwood. Wildlife habitat is also abundant and diversified, with many species utilizing the variety of habitat found here. Productive timber lands represent some of the most productive sites on the Forest. This management area also provides the main access to National Forest lands with major roads either within or adjacent to the management area. Included within this management area are 4,637 acres of non-forest lands, lands not capable of producing industrial products and lands physically unsuited for timber production. The majority of lands within this management area are of a high visual sensitivity level.

Management Goals:

Manage riparian areas to feature riparian dependent resources (fish, water quality, maintenance of natural channels, certain vegetation and wildlife communities) while producing other resource outputs at levels compatible with the objectives for dependent resources and:

- meet or exceed state water quality standards
- protect soil productivity
- provide cost effective timber production
- provide for big game and non-game wildlife habitat
- provide opportunities for dispersed recreation consistent with riparian protection requirements
- meet visual quality objectives

Management Area 16 cont.

Standards:

**Resource
Element**

Standards

RECREATION

**Developed Recreation
Management**

Locate camping and picnicing facilities at least 100 feet from streams and lakes, where conflicts with riparian dependent resources occur.

**Dispersed Recreation
Management**

Manage for roaded natural and semi-primitive ROS experiences. Approximately 5,700 acres of this management area are within Management Area 10 (not included in the total acres of MA 10).

Use off-site and on-site interpretation signing for site protection and information.

Visual Management

Manage for approximately 13,300 acres of retention VQO and 17,800 acres of partial retention VQO. The remaining area has a VQO of modification or maximum modification. Existing areas that do not meet VQO will be brought up to standard as it is cost effective to do so.

Trail Management

Trail construction and reconstruction is permitted where compatible with management area objectives.

**WILDLIFE
AND FISH**

**Wildlife Habitat
Management**

Manage for a diversity of deciduous and coniferous vegetation. Provide habitat for old-growth dependent species through extended rotations and timber harvest scheduling.

Establish and maintain waterfowl habitat improvement areas as appropriate.

Management Area 16 cont.

**Resource
Element**

Standards

Fisheries Management

Maintain and improve fisheries habitat to meet or exceed the Forest fish population goals. Habitat improvements may include such items as rearing ponds, rearing pens and spawning channels.

RANGE

Range Management

Maintenance of natural channels and adequate streamside vegetation will have a high priority in range allotment plans and prescriptions. A specific objective

for stream bank protection will be included in all allotment plans where second order or larger streams are involved.

Manage all allotments to obtain no more than five percent streambank trampling damage (bare soil).

Consider development of alternative water sources outside riparian zone.

TIMBER

Timber Harvesting

Timber management regimes will be based upon analysis of site specific objectives considering among other items, the riparian resource needs, cost efficiency and cost effectiveness. Both even-aged and uneven-aged regeneration systems will be used to protect and maintain riparian resource values. Even-aged management will generally open no more than 600 feet along a stream or lake, and no more than 5 to 6 percent of a stream in one decade except as needed for riparian dependent resources. Rotations may be extended to maintain or enhance riparian dependent resources. Intermediate harvests will be used to meet timber management objectives.

Minimize surface disturbance by not operating during wet periods and through the selection of logging systems.

Management Area 16 cont.

| <u>Resource Element</u> | <u>Standards</u> |
|---|---|
| | Salvage will be accomplished when riparian resources can be protected. |
| | Harvest restricted to low use periods for wildlife and recreation. |
| Reforestation | Planting will be used as needed to meet resource objectives as prescribed in the Stand Silvicultural Prescription. Reforestation of currently non-stocked lands and rehabilitation of cull and stagnated stands will be based upon analysis of cost efficiency, cost effectiveness, resource goals and objectives of the specific site. Site preparation generally by means other than machine scarification. |
| Timber Stand Improvement | Precommercial thinning will be used consistant with the level of management intensity when not in conflict with riparian objectives. |
| WATER AND SOIL | |
| Soil and Water Protection | Refer to the Best Management Practices Handbook. |
| Water Resource Improvement | Continuing unacceptable sediment sources on all high value fisheries streams will be corrected as necessary to meet water quality standards. |
| FACILITIES | |
| Road Construction and Reconstruction | Except for stream crossings, limit new construction to cases where no reasonable environmentally sound alternative exists, as determined by an environmental assessment. |
| | Pursue replacement of existing stream crossing barriers with structures allowing fish passage where continued blockage will interfere with the attainment of Forest fishery goals. |

Management Area 16 cont.

| <u>Resource Element</u> | <u>Standards</u> |
|-----------------------------|---|
| PROTECTION | |
| Insects and Disease | Integrated pest management will be used where needed to meet management area objectives. Biological control will be given priority. |
| Prescribed Fire | Prescribed fire will be used as needed to meet silvicultural objectives as prescribed in the stand Silvicultural Prescription. Pile slash at least 30 feet back from stream channels or above high water mark or topographic breaks. Attempt to pile slash during the logging operation but before the next high flow period. |
| Fire Protection | Confine, contain, and control fires within the management area. Use of dozers only when needed to protect riparian resource values. |

Schedule of Management Practices:

Proposed Program (First Decade)

| <u>Management Practices:</u> | <u>Acres</u> | <u>Average Annual Volume MMBF</u> |
|---|--------------|---|
| Timber Harvest (Allowable Sale Quantity) | | |
| Clearcut | 55 | 0.8 |
| Shelterwood-Seed Cut | 20 | 0.2 |
| Shelterwood-Removal Cut | 0 | 0 |
| Selection | <u>40</u> | <u>0.4</u> |
| Total | 115 | 1.4 |
| Reforestation | 123 | |
| Timber Stand Improvement | 0 | |

Management Area 16 cont.

| | <u>Miles</u> |
|-----------------------------------|--------------|
| Road Construction | 5 |
| Road Reconstruction | <u>2</u> |
| Total | 7 |
| Wildlife/Fish Habitat Improvement | |
| | <u>Acres</u> |
| Fish Habitat Improvement | 239 |

Projected Program (Second Decade)

| <u>Management Practices:</u> | <u>Acres</u> | <u>Average Annual Volume MMBF</u> |
|---|--------------|---|
| Timber Harvest (Allowable Sale Quantity) | | |
| Clearcut | 55 | 0.8 |
| Shelterwood-Seed Cut | 20 | 0.2 |
| Shelterwood-Removal Cut | 0 | 0 |
| Selection | <u>40</u> | <u>0.4</u> |
| Total | 115 | 1.4 |
| Reforestation | 131 | |
| Timber Stand Improvement | 0 | |

| | <u>Miles</u> |
|-----------------------------------|--------------|
| Road Construction | 2.0 |
| Road Reconstruction | <u>0.5</u> |
| Total | 2.5 |
| Wildlife/Fish Habitat Improvement | |
| | <u>Acres</u> |
| Fish Habitat Improvement | 239 |

Monitoring and Evaluation Requirements:

The monitoring requirements from Chapter IV that are applicable to the management area are: A-1, A-2, B-1, B-2, B-3, B-4, B-5, C-1, D-1, E-1, F-1, F-2, F-3, G-1, G-2, G-3, G-4, H-1, I-1, J-1, and K-1. The procedures outlined in Chapter IV will be followed to evaluate the data gathered during monitoring.

APPENDIX E

FOREST-WIDE MONITORING PLANS

For the Clearwater National Forest:

G. MONITORING AND EVALUATION

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

Monitoring and evaluation entails comparing the end results being achieved to those projected in the Plan. Costs, outputs, and environmental effects, both experienced and projected, will be considered.

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 are based have changed over time. When changes occur, they will be evaluated as to their significance and appropriate amendments or revisions made. 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;

Table IV-1 cont. Forest Plan Monitoring Requirements - Action Plan

| NFMA Requirement 36 CFR 219 | Item No. | Actions, Effect, or Resources to be Measured .12(K)(4a) | Expected Precision .12(K)(4b) | Expected Reliability .12(K)(4b) | Reporting Time .12(K)(4c) |
|-----------------------------------|-------------|---|-------------------------------------|---------------------------------------|---------------------------------|
| .22(f) | 26 | Moose | Moderate | Moderate | 5-Yr Rpt |
| | 27 | White-tailed Deer | Moderate | Moderate | 5-Yr Rpt |
| | 28 | Belted Kingfisher | High | Low | 5-Yr Rpt |
| | 29 | Pileated Woodpecker and Goshawk | High | Low | 5-Yr Rpt |
| | 30 | Pine Martin | Moderate | Moderate | 5-Yr Rpt |
| | 31 | Anadromous Fish Indicators | High | Moderate | 5-Yr Rpt |
| | 32 | Resident Fish Indicators | High | Moderate | 5-Yr Rpt |
| | | Population Trend of T & E Species | | | |
| | 33 | Gray Wolf | Low | Moderate | 5-Yr Rpt |
| | 34 | Bald Eagle | Low | High | 5-Yr Rpt |
| | 35 | Grizzly Bear | Low | Moderate | 5-Yr Rpt |
| | 36 | Minerals Resource Availability | Moderate | Moderate | 5-Yr Rpt |

Table IV-2.

Monitoring Requirements Applicable To Each Management Area

| | | Management Areas | | | | | | | | | | | | | | | | |
|------------|----------------------|------------------|----|----|----|----|----|----|----|----|----|----|----|-----|----|----|----|----|
| Monitoring | Items | A2 | A3 | A4 | A5 | A6 | A7 | B1 | B2 | C1 | C3 | C4 | C6 | C8s | E1 | E3 | M1 | M2 |
| 1 | Performance Outputs | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| 2 | Recreation Opport. | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | | x |
| 3 | Visual Quality | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| 4 | Cultural Resource | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| 5 | Wilderness | | | | | | | x | x | | | | | | | | | |
| 6 | Livestock Forage | | x | | | | | | | x | | x | x | x | x | x | | x |
| 7 | Diversity | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| 8 | Water Quality | x | x | x | x | x | x | | | | x | x | x | x | x | x | | x |
| 9 | Pest Mgmt Pract. | x | x | x | x | x | x | | | | x | x | x | x | x | x | | x |
| 10 | Riparian Area | x | | | | | x | | | | | | | | | | | x |
| 11 | Site Productivity | | x | x | | x | x | | | | x | x | x | x | x | x | | x |
| 12 | Land Adjustment | x | | x | | x | x | x | x | | x | x | x | x | x | x | | x |
| 13 | Road Management | | | x | | x | x | | | | | x | | x | x | x | | x |
| 14 | Off-Road Vehicles | | x | x | | x | x | | x | x | x | x | x | | x | x | | x |
| 15 | Minerals Development | x | x | x | | x | x | | | x | x | x | x | x | x | x | x | x |
| 16 | Trail Management | x | x | x | | x | | x | x | x | x | x | x | x | x | x | | x |
| 17 | Unit Costs | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | x |
| 18 | Restocking | | | x | | x | | | | | | x | | x | x | x | | x |

Monitoring Requirements Applicable To Each Management Area

Monitoring

[illegible]

For the Nezperce National Forest:

D. Monitoring and Evaluation

Monitoring and evaluation comprise the management control system for the Forest Plan. They will provide the decisionmaker and the public 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. Costs, outputs, and environmental effects, both experienced and projected, will be considered.

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.

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

1. How well the Forest is meeting its planned goals and objectives;
 2. If existing and emerging public issues and management concerns are being adequately addressed;
 3. How closely the Forest Plan's management standards are being followed;
 4. If outputs and services are being provided as predicted;
 5. If the effects of implementing the Forest Plan are occurring as predicted, including significant changes in the productivity of the land;
 6. If the dollar and manpower costs of implementing the Forest Plan are as predicted;
 7. If implementing the Forest Plan is affecting the land, resources, and communities adjacent to or near the Forest;
 8. If activities on nearby lands managed by other Federal or other governmental agencies, or under the jurisdiction of local governments, are affecting management of the Forest;
 9. If research is needed to support the management of the Forest, beyond that identified in Chapter II of the Forest Plan; and
-

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

The monitoring requirements for this Forest Plan are outlined in Table V-1, Forest Plan Monitoring Requirements. These requirements address the items to be monitored, expected precision and reliability, and reporting period. 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). More details on each monitoring requirement are contained in Appendix O.

Other monitoring items are more applicable to broad areas or are Forestwide in nature, and will be evaluated from such sources as the data base, Forest attainment reports, public involvement processes, and non-Forest Service sources. These items are listed in Table V-1.

An annual monitoring program, developed in accordance with the monitoring requirements listed in Table V-1, will be prepared as part of the Forest's annual work program. This program will be based on available funds. If funds are inadequate to properly monitor the Forest Plan goals and objectives, an analysis will be made to develop a further course of action. This may include Forest Plan amendment or revision, revising implementation schedules or dropping projects.

Evaluation of data gathered during monitoring will be guided by the Decision Flow Diagram detailed in Figure V-1. As indicated in the diagram, the results of this evaluation lead to decisions on further action of the following types:

1. Continuing the management practices;
2. Referring the problem to the appropriate line officer for improvement of the application of the management practice;
3. Modifying the management practices as a Plan amendment;
4. Modifying the land management prescriptions as a Plan amendment;
5. Revising the schedule of outputs;
6. Revising the cost/unit output; or
7. 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:

1. A quantitative estimate of performance comparing outputs and services with those projected by the Forest Plan;
 2. Documentation of measured effects, including any change in productivity of the land;
 3. Unit costs associated with carrying out the planned activities as compared with unit costs estimated during Forest Plan development;
 4. Recommendations for changes;
 5. A list of needs for continuing evaluation of management systems and for alternative methods or management;
-

6. A list of additional research needed to support the management of the Forest; and
7. Identification of additional monitoring needs to facilitate achievement of the monitoring goals.

The results and trends of monitoring will be evaluated annually. By March 1 of each year a report will be prepared summarizing the results of the past years monitoring efforts. This report will be available and sent to those members of the public who request a copy.

The Forest will maintain a mailing list of those members of the public who want to stay informed about Forest Plan implementation activities (e.g., monitoring and evaluation activities and results, project level analysis and decisions, etc.).

Table V-1 -- Forest Plan Monitoring Requirements

| NFMA Requirement 36 CFR 219 | Item No. | Actions, Effects, or Resources to be Measured | Expected Precision | Expected Reliability | Reporting Time |
|--------------------------------|-------------|--|-----------------------|-------------------------|----------------|
| .12(K)(1) | 1a | Recreation Visitor Days. | Low | Low | 5 years |
| .12(K)(1) | 1b | Acres of ROS category. | Low | Low | 5 years |
| .12(K)(1) | 1c | Big-Game Habitat Carrying Capacity. | Moderate | Moderate | 5 years |
| .12(K)(1) | 1d | Nongame Habitats | Moderate | Moderate | 5 years |
| .12(K)(1) | 1e | Acres of big-game habitat improve- ments. | High | High | Annually |
| .12(K)(1) | 1f | Acres/number fish habitat improve- ments. | High | High | Annually |
| .12(K)(1) | 1g | Animal Unit Months Grazing Permits. | High | High | Annually |
| .12(K)(1) | 1h | Allowable Sale Quantity by components. | High | High | Annually |
| .12(K)(1) | 1i | Acres timber harvest by method (including precommercial thinning). | High | High | Annually |
| .12(K)(1) | 1j | Soil and Water rehabilitation and improvements. | High | High | Annually |
| .12(K)(1) | 1k | Acres and Numbers of Wildfires. | High | High | 5 years |
| .12(K)(2) | 2a | Off-road vehicle impacts | Low | Low | 5 years |
| .12(K)(2) | 2b | Adequacy of cultural resource protection, impacts on cultural resources. | Moderate | Moderate | 5 years |
| .12(K)(2) | 2c | Limits of Acceptable Change in Wildernesses. | Low | Low | 5 years |
| .12(K)(2) | 2d | Achievement of visual quality objectives. | Moderate | Moderate | 5 years |

Table V-1 (Continued) -- Forest Plan Monitoring Requirements

| NFMA Requirement 36 CFR 219 | Item No. | Actions, Effects, or Resources to be Measured | Expected Precision | Expected Reliability | Reporting Time |
|--------------------------------|-------------|--|-----------------------|-------------------------|----------------|
| .12(K)(2) | 2e | Fish habitat trends by drainage. | High | High | 1-5 years |
| .12(K)(2) | 2f | Vegetative response to treatments. | Moderate | Moderate | 5 years |
| .12(K)(2) | 2g | Impacts of management activities on soils. | Moderate | Moderate | Annually |
| .12(K)(2) | 2h | Impacts of management activities on water quality. | Moderate | High | Annually |
| .12(K)(2) | 2i | Effectiveness of specific water quality mitigation measures. | Moderate | High | Annually |
| .12(K)(2) | 2j | Impacts of management activities on riparian areas. | Moderate | Moderate | Annually |
| .12(K)(2) | 2k | Mitigation measures used for and impacts of transportation facilities on resources. | Moderate | Moderate | 5 years |
| .12(K)(2) | 2l | Adequacy of transportation facilities to meet resource objectives and user needs. | Moderate | Moderate | 5 years |
| .12(K)(2) | 2m | Adequacy of Mining Operating Plans and Reclamation Bonds. | Low | High | Annually |
| .12(K)(3) | 3 | Costs of implementing resource management prescriptions. | High | High | Annually |
| .12(K)(3) | 3a | Forest resource-derived revenues. | High | High | Annually |
| .12(K)(5a) | 4 | Acres of harvested land restocked within 5 years. | High | High | 5 years |
| .12(K)(5b) | 5 | Unsuited timber lands examined to determine suitability. | High | High | 10 years |
| .12(K)(5c) | 6 | Maximum size of opening for harvest units. | High | High | Annually |
| .12(K)(5d) | 7 | Insect and disease activity. | Low | Moderate | Annually |
| .7(f) | 8 | Effects of National Forest Management on lands, resources, and communities adjacent to the Forest. | Moderate | High | Annually |
| .7(f) | 9 | Effects of other Government agencies' activities on the National Forest. | Moderate | Moderate | Annually |
| .19(6) | 10 | Population trends of indicator species--wildlife and fish. | Moderate | Moderate | 3-5 years |
| .12(K)(2) | 11 | Validation of resource prediction models: wildlife, water quality, fisheries, timber. | Moderate | Moderate | 2-5 years |

Figure V-1 – Decision Flow Diagram

