

WATER QUALITY BUREAU REPORT

FINAL REPORT:
FOREST PRACTICES WATER QUALITY AUDIT
1988



**Idaho Department of Health & Welfare
Division of Environmental Quality
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April, 1989

FINAL REPORT: FOREST PRACTICES WATER QUALITY AUDIT - 1988

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EXECUTIVE SUMMARY

Forty projects were audited; 10 Forest Service, 10 Department of Lands, 10 forest industry and 10 private non-industrial. The audit team was composed of representatives of land management agencies, regulatory agencies and private industry with expertise in fisheries biology, hydrology, forestry, forest road construction and water quality. A representative of conservation groups was invited, but the offer was declined due to the extensive time required for the audits. Audited projects were selected from pools of projects which met criteria established by the audit team. The most critical criteria assured the close proximity of the activity to a protected fishery or domestic water supply and the potential for non-point source pollution.

The Forest Practices Audit was conducted to answer the following specific questions:

- WERE THE BMPs APPLIED BY THE AGENCIES AND OPERATORS?
- WERE THE BMPs EFFECTIVE IN PREVENTING SEDIMENT PRODUCTION?
- HAVE POLLUTANTS BEEN DELIVERED TO THE STREAM OR POTENTIALLY COULD THEY BE?
- ARE THERE ANY IMPLEMENTATION PROBLEMS WITH THE BMPs?
- ARE THERE ANY BMP IMPLEMENTATION PROBLEMS SPECIFIC TO LAND OWNERSHIP CATEGORY?

Projects were examined by walking roads, skid trails and streams. Compliance with BMPs was determined. Soil erosion surfaces and actual or potential pathways by which eroded materials could be transported to the streams were identified. Class I streams were examined to assess their water quality condition and the impact of the project.

Results and Recommendations:

BMP Compliance

Compliance with the BMPs was high on federal, state and forest industry projects, averaging 95% of the opportunities to apply BMPs. Compliance on non-industrial private projects was 86%. Where the BMPs were not applied pollutants were delivered to waters in 70% of the cases.

BMP Effectiveness:

The audit team did not observe any pollutants delivered to streams in 99% of the cases where the BMPs were applied.

Project Impact

The projects audited were consistently judged to have either no observable or minimal impact on the class I streams.

Implementation Findings:

Non-compliance patterns indicated the need for clarification and adjustment of a few specific rules. The audit team judged overall degree of BMPs compliance acceptability of the individual projects. This is in contrast to the individual rule percentages discussed above. Rule implementation problems were specific to the landowners:

Forest Service

Four of ten Forest Service projects were judged to have unacceptable levels of BMP implementation. The central cause of the implementation problem was the insufficient knowledge timber sale administrators had of the Forest Practices Act and their obligation to implement its rules to comply with the Clean Water Act. Certain Forest Service guidelines applied on some forests were found to be more lenient than the BMPs. Federal land managers require a mechanism to obtain variances to the rules, when justified. This mechanism is currently not available.

Department of Lands

Compliance level on IDL projects was very high. One of ten projects was judged to have an unacceptable level of BMP implementation. Inappropriate variances to the rules were granted which resulted in stream sedimentation on the unacceptable project. Use of the variance occurred as a result of a misinterpretation of Land Board policy.

Forest Industry Lands:

Three of ten forest industry projects had unacceptable levels of implementation. Reasons for poor implementation on forest industry projects were varied with no pattern.

Private Non-industrial Lands:

Unacceptable levels of BMP implementation were found on seven of ten private non-industrial projects. The root cause on private non-industrial

projects is the lack of professional forestry expertise involved in the planning of these harvests. Forest operators and owners on non-industrial private projects are not implementing the FPA rules in many cases. Private non-industrial owners and the operators under contract to them need additional information and education, combined with stricter enforcement of the Forest Practices Act.

Recommendations:

Forest Service

- : Provide more intensive training for national forest staff on the Clean Water Act, its implementation by the state and the role of the Forest Practices Act Rules and Regulations as the BMPs.
- : Change those contract B and C clauses for timber sales to insure consistency with the standards of the FPA.
- : Provide training for field level timber staff and engineers in application of the FPA rules and regulations, with emphasis on BMP techniques.
- : Develop a procedure for obtaining FPA variances. Incorporate variance procedures into Forest Service manual supplements for Regions 1 & 4.

Department of Lands

- : Maintain the emphasis placed on BMP compliance, which has fostered high compliance rates on state projects.
- : Examine variances to the rules more closely in locations where unacceptable impacts to water quality may occur.
- : Assure uniform interpretation of Land Board policy among forest management staff regarding balance between maximized revenue and resource protection.

Forest Industry Lands

- : Maintain and improve adherence to FPA by industry operators and foster its universal implementation on forest industry projects.

Private Non-industrial Lands

- : Develop a mechanism which requires input of professional forestry expertise prior to the start of private non-industrial projects near class I streams, important class II streams and with logging operators with a previous history of FPA noncompliance.
- : Emphasize information and education programs for forest operators.
- : Enforce the Forest Practices Act Rules and Regulations more vigorously; consider operators certification as an option to control performance.

Eighty percent (35 of 44) of the streams assessed have intermediate or high levels of sedimentation from past activities. The sedimentation was traced to causes, which included roading and harvest projects conducted prior to the Forest Practices Act, grazing and recreational vehicular traffic. Many of the roads identified as currently causing stream sedimentation are still in use.

The agency specific recommendations provided above will, if implemented, further restrict the sediment supply produced by new projects. However, they will do little to correct sedimentation from past activities identified in 80% of the streams examined during the audit. Alleviation of these water quality problems will require the implementation of the following recommendations by all forest landowners:

- : Identify existing sediment sources and means to stabilize them. This should be done by the land managers on a watershed basis.
- : Identify roads which continue to discharge sediment to streams and investigate their relocation or suitable stabilization on a case by case basis.

INTRODUCTION

The Forest Practices Audit is conducted as one measure of the effectiveness of the regulatory system in protecting water quality during timber harvest projects. During the summer of 1988 an interdisciplinary team audited forty projects that were representative of harvest activity which occurs on state, private, and federal forest land.

The audit is based on state and federal regulatory authority described in the Forest Practices Water Quality Management Plan (1988). The management plan describes the feedback loop process for control of nonpoint source pollution from project activities. The Idaho Department of Health and Welfare-Division of Environmental Quality (DEQ) is delegated authority to implement the nonpoint source sections of the federal Clean Water Act. DEQ's primary role is to evaluate the Best Management Practices (BMPs) for adequacy in protecting beneficial uses of water. The Idaho Department of Lands (IDL) is the designated management agency for state and private lands, and the U.S. Forest Service (USFS) and Bureau of Land Management (BLM) are the designated management agencies for the public lands they administer.

The Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 16.01.2003,01) define a Best Management Practice as:

" a practice or combination of practices determined by the Department to be the most effective and practicable means of preventing or reducing the amount of pollution generated by nonpoint sources."

The Rules and Regulations Pertaining to the Idaho Forest Practices Act (IDAPA 20.15) are identified in the standards as the BMPs for forest practices. IDL administers these rules on state and private land. As BMPs the rules are recognized as the minimum management requirements on federal, state and private lands. The FPA Rules (IDAPA 20.15.01.s) define a forest practice as:

" the harvest of forest tree species, road construction associated with harvesting of forest tree species, reforestation, use of chemicals or fertilizers for the purpose of growing or managing forest tree species or the management of slashings resulting from harvest management or improvement of forest tree species."

For clarity a forest practice is referred to as a project in this report. The audit was confined to projects involving forest harvest and forest road construction and impacts they may have on Class I streams.

The management plan calls for an audit of the BMPs every four years. The general goal of the audit is "to determine if the forest management agencies and forest operators are using the prescribed BMPs and if these practices are providing reasonable control of surface erosion and mass failure of forest practices".

The 1988 audit team identified the following questions as objectives of the audit:

- Were the BMPs applied by the agencies and operators?
- Were the BMPs effective in preventing sediment production?
- Have pollutants been delivered from the project to a stream or potentially could they be?
- Are there any implementation problems with the BMPs?
- Are there any BMP implementation problems specific to a land ownership category?

It was recognized in planning sessions that not all questions concerning the effectiveness of BMPs in limiting nonpoint source pollutants could be answered in the format of a Forest Practices Audit. This type of audit does not assess cumulative effects of nonpoint source activities. The audit focuses on ocular assessment of upland erosion, observation of sediment delivery pathways and evidence of in-channel sedimentation. An audit of this nature cannot assess all potential impacts of projects on receiving waters, but does provide a valuable evaluation of the regulatory process.

The team sought to uncover problems which made the BMPs less effective either in application or function. In this report we will identify problems and suggest solutions through changes to administrative procedure or regulations.

METHODOLOGY

Audit Team Selection:

The audit team was composed of six individuals on each audit. These individuals represented land management agencies (U.S. Forest Service

(USFS) and IDL, regulatory agencies (DEQ and Idaho Department of Fish & Game (IDFG) and private industry. A representative of conservation groups was sought, but none was able to participate due to the extensive time required for the audits. The agency or industry group chose its representatives. Since Regions 1 and 4 of the Forest Service were covered by the audit, representatives were appointed from both regions. Membership of the Bureau of Land Management (BLM) was not pursued because none of their projects were audited, even though BLM representatives participated in the early planning sessions. Audit team members are listed on the title page. Audit team member's expertise is centered in the fields of fisheries biology, hydrology, forestry, forest road construction and water quality.

Project Selection:

Lists of projects that met certain criteria were obtained from the USFS, BLM, and IDL. IDL prepared lists for both state and private lands. Projects on private lands fall into two distinct categories. Forest industry projects refers to projects on large holdings managed by corporate timber companies. Non-industrial private includes the approximately 37,000 owners of small private tracts. The criteria for project nominations were as follows:

- Land disturbance by roading and/or logging began in 1986 or 1987.
- A class I stream is present on the area or within 150 feet.
- Land disturbance affected an area of at least 10 acres.
- The project can be reached by road.
- The audit team has permission to visit the site on private land. Permission was never denied.
- Preferably a project map of the area is available.

The criteria of primary importance were the presence of class I waters and disturbance by either forest roading or logging. These two criteria insure the close proximity of sensitive beneficial uses of a class I streams to potential nonpoint sources of pollution. Since projects yield the most sediment in their initial two years, the team preferred to audit projects begun either in 1986 or 1987. Projects larger than 10 acres were sought because projects of this size or greater were believed to provide a more representative sample of a project. The criteria concerning road access, permission to visit and a project map were included to expedite auditing the project. Permission to visit a site was not denied for any project.

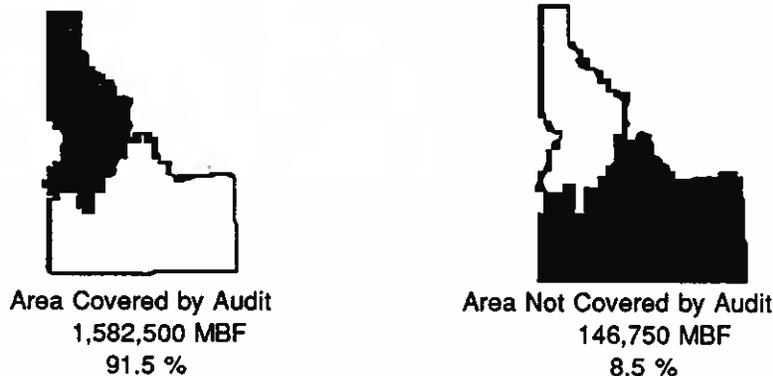
During 1986 and 1987, 5,303 projects were conducted on federal, state and private lands (Table I). Three hundred and fifty-two projects, 6.6%, met the audit criteria. The audit team believed that these are the projects which could potentially have the greatest impact on water quality. The location of these projects was plotted on 1: 100,000 scale BLM Surface Ownership Maps. Thirty of the projects were found to be distributed across southeast Idaho. The audit team decided to drop this area from consideration in order to concentrate on areas of more intense logging activity (Table II). Since federal projects had rated high in an earlier audit, emphasis was placed on private projects by reserving 20 of the 40 audits for forest industry and private non-industrial categories. The participating agencies could afford 5 person-weeks of auditing effort. The team decided it could audit 40 projects during five weeks. The audit team settled on equal sample sizes of 10 projects per land ownership category. The decision to have equal sample size for each ownership category, results in different percentages of audits by land ownership category (Table I).

Table I. Projects Profile in the State of Idaho in 1986 and 1987.

Ownership	Federal	State	Private Industry	Non-industrial	Total
Total Forest Projects	1,212	103	715	3,273	5,303
Projects Meeting Criteria	77	38	70	174	359
Projects Audited	10	10	10	10	40
Percentage Audited	13%	26%	14%	6%	11%

Note: Percentages are the fraction of projects audited which met the criteria.

Table II. Geographic Distribution of Projects in Idaho.



Note: Shown as the total volume cut during 1987 in MBF.

Since travel to the project is time consuming, the audit team selected projects based out of travel centers. The travel centers were Sandpoint, Coeur d'Alene, St Maries, Orofino and McCall. No candidate projects were eliminated from selection by selecting travel centers. Slips representing each project around a travel center were pooled in a hat and drawn to fill two slots for each land ownership category. The slips were placed in the pool by DEQ personnel and selections were drawn by IDL personnel. Slips were drawn until all eight slots for a travel center were filled. Two alternates were drawn for each slot to replace projects found not to fully meet the criteria upon closer inspection. A selected project did not represent any particular subdivision of an ownership group. For example a project chosen, which happened to be on the Boise National Forest represented federal projects and not specifically the Boise National Forest.

Verification that a project met the audit criteria set was made following its selection. The verification insured the audit team against wasted time on projects which did not meet the nomination criteria. The characteristics of each selected project was verified with the responsible agency manager or Forest Practices Act Advisor. Selected projects did not meet the audit criteria in only two cases. One project was less than 10 acres in size, while the second was further than 150 feet from a class I stream. In these cases the selected alternates were substituted.

Rating Forms:

Rating forms were developed over a three month period by the audit team. The forms were finalized following testing on two calibration audits. The forms are comprised of ratings for compliance, effectiveness and responsibility for noncompliance, assessment of the class I stream(s) and a summary page. A copy of the rating form is shown in Appendix A.

Project Inspection Protocol:

Since projects typically cover many acres, it was necessary for the audit team to divide into two sub-groups to make an inspection. A sub-group examined and rated the water quality characteristics associated with fisheries habitat of the class I stream(s). This sub-group included audit team members with expertise in fisheries biology and hydrology. They were assisted by Water Quality Specialists from the DEQ field offices. The second sub-group examined the upland portion of the project. This sub-group included individuals with expertise in hydrology, forestry

and forest road construction. Sub-groups inspected the upland and riparian areas of the project to determine compliance with the rules, to identify soil erosion features and to identify actual or potential pathways by which eroded materials could reach streams.

Projects were inspected with a protocol developed during two calibration audits and a subsequent meeting in early May 1988. An audit generally consisted of:

1. obtain background information on the project prior to the site inspection (Appendix A, pages 1&2).
2. obtain an overview of the project from the responsible agency manager or landowner representative.
3. study a map of the project and decide on the number and composition of sub-teams required to inspect as much of the area as possible. The audit team divided into the sub-groups described previously to examine the project. The sub-group examining Class I streams completed a stream assessment based on the protocol in Appendix B.
4. inspect the project in the time allotted to view the critical features.
5. reassemble the group to compare observations and if necessary view any problem areas.
6. complete the audit forms by the consensus of the six audit team members.

Typically, observers from agencies, conservation groups and the interested public attended the audits. Input from these observers was considered by the audit team. Final decisions on rating the project were made by the audit team members.

Audits of projects required between 2 and 4 1/2 hours plus travel time dependent on their size and the number of problems identified.

Audit Time Frame:

Audits of the projects selected began the fourth week of May and were conducted every other week until the third week of July, 1988. Weather conditions during the actual audits were generally dry, although a few days of rain were experienced. Rain the week prior to the audit of a group of projects was common in May, June and early July.

Limitations of the Audit Methodology:

Techniques used in the audit have limitations which must be considered when analyzing the audit results.

The audit technique consisted of a one-time field inspection and assessment. Roads, skid trails and streams were walked. This approach documents erosion and sedimentation problems which occur in the first and second year. The first and second years following a project are recognized as the critical erosion period. The stream assessment was based on visual appraisal of sediment deposition in salmonid spawning and rearing habitats. The results are a snapshot in time of BMP effectiveness and sediment impacts. They do not reflect potential future impacts. The concept of cumulative effects could not be addressed in this audit. These questions will require long term monitoring and demonstration projects to resolve and are being addressed in other studies.

On very large projects, the team was unable to see every acre of the project, because of time constraints. In these cases the team concentrated its efforts on the roads and areas immediately adjacent to class I and class II streams. This approach uncovered the problems of noncompliance that have the greatest potential to impact water quality and was considered a representative sample of the project acreage.

A single action is often regulated by several rules. In cases of noncompliance or BMP ineffectiveness, only the major or substantive rule was noted, although other rules were often referenced. This procedure allowed the audit team to focus on the major aspect of the noncompliance and facilitate improvement of the BMPs. As a result of this procedure, an absolute number of noncompliances cannot be provided, but the numbers listed are a fair comparative representation of compliance and noncompliance.

Although the previous two years were considered drought conditions, the team judged that the number of noncompliances would not have increased substantially. Compliance is basically a function of operators following the BMPs; this is not weather dependent. Below normal precipitation may have decreased delivery of sediment to stream channels. Decreased delivery to stream channels may have affected the perceived impact of the projects audited on the Class I streams. The audit team believes sufficient precipitation was received in spring and summer rains to test the effectiveness of the BMPs. The team judged that this condition of lower precipitation did not have an effect on the overall

conclusions and recommendations of this audit, especially in evaluation of the regulatory system and implementation of the BMPs.

Thirty-eight of the 59 BMPs are related to road planning, construction and maintenance; 13 of these are related to road planning. The road planning BMPs were generally not audited in the field. Evaluation of these rules would require review of plans and specifications, which the audit team rarely had. Planning rules were rated by the audit team when construction problems indicated that planning specifications had failed. However, road construction and maintenance rules were inspected.

RESULTS & DISCUSSION

Compliance and Effectiveness of Best Management Practices (BMPs)

The audit team rated compliance with the specific FPA rules. Separately, the team rated the effectiveness of the BMP in controlling surface erosion and sediment delivery.

BMPs were complied with in the majority of cases (Table III). BMPs were not complied with 3, 5 and 6% of the time on state, forest industry and federal projects, respectively. A higher noncompliance rate of 14% occurred on non-industrial private projects. These percentages do not reflect the environmental effect; see the discussion under Implementation Problems below.

When BMPs were complied with, they were judged to effectively prevent sedimentation of streams 99% of the time. When BMPs were not complied with, water quality impacts occurred an average of 70% of the time. This observation emphasizes the importance of strict enforcement of the FPA rules and regulations on all ownerships.

Implementation Problems

Projects considered to have an unacceptable level of BMP compliance are identified by landowner category in Table IV. The audit team judged overall degree of compliance of the individual projects with the BMPs. This is in contrast to the individual rule percentages discussed above. A project may be viewed as unacceptable for a number of reasons - one rule not complied with repeatedly, a number of rules with a minor degree of noncompliance, or one problem that was considered a major source of sediment, etc. A project was not judged unacceptable if only a few minor noncompliances were noted or if an existing nonpoint source problem was

TABLE III. APPLICATION AND EFFECTIVENESS OF BEST MANAGEMENT PRACTICE

LANDOWNER	# PROJECTS INSPECTED	PROJECTS WITH UNACCEPTABLE IMPLEMENTATION	# BMPs RATED	BMPs NOT APPLIED				BMPs APPLIED			
				NUMBER NOT APPLIED		POLLUTANTS DELIVERED TO STREAM, WHERE BMPs NOT APPLIED		NUMBER APPLIED		BMPs APPLIED & NOT EFFECTIVE	
				Number	(%)	Number	(%)	Number	(%)	Number	(%)
USFS	10	4	337	19	(6)	14	(74)	318	(94)	4	(1)
IDL	10	1	368	12	(3)	10	(83)	356	(97)	6	(2)
TI	10	3	329	17	(5)	11	(65)	312	(95)	3	(1)
NIP	10	7	266	38	(14)	25	(66)	228	(86)	0	(-)
TOTAL	40	15	1,300	86	(7)	60	(70)	1,214	(93)	13	(1)

Note: USFS- U.S. Forest Service, IDL- Idaho Department of Lands, FI- industrial private lands, NIP- non-industrial private lands. Numbers displayed are the simple compilation of the opportunity to apply a BMP at least once on the projects audited and the number of cases of noncompliance or ineffectiveness, in at least one instance, found. Compliance with all but a single BMP, which was not implemented throughout the project resulted in a project being judged to have an unacceptable level of BMP compliance (see Implementation problems p. 12).

observed. The type of impact in the table does not indicate magnitude and does not indicate that the projects resulted in a major stream impact. This column only indicates the type of impact that can be expected as a result of the unacceptable activity. Stream impacts observed during the audit are discussed in the section on page 18.

Table IV. Projects Judged to have Unacceptable BMP Implementation, Causes and Impact by Land Ownership

<u>Ownership</u>	<u>Project Number</u>	<u>Cause</u>	<u>Type of Impact</u>
FOREST SERVICE	2	Skidding in class II in violation of FPA.	sediment
	4	Removal of canopy along class I; failure to remove slash, in violation of FPA.	blockage by slash; lack of cover
	6	Poor road construction in violation of FPA.	sediment
	9	Skidding in class II; failure to stabilize exposed areas, in violation of FPA.	sediment
DEPT. OF LANDS	10	Reuse of trails too close to class II streams	sediment
FOREST INDUSTRY	3	Location of trails in SPZ; soil in SPZ; wet areas consideration; inadequate road drainage; too many class II stream crossings, in violation of FPA.	sediment
	6	30% skid trail limitation; drainage of skid trails; abandoned road drainage, in violation of FPA.	sediment
	8	Sidecast to stream; stabilize sediment hazard, in violation of FPA.	sediment

Ownership	Project Number	Cause	Type of Impact
NON-INDUSTRIAL PRIVATE	1	Wet areas consideration; skidding in class I stream; landing in class I SPZ; stream alteration law, in violation of FPA.	sediment
	2	Landing and skid trail in class I SPZ; skid trail stabilization; slash in class I; soil in SPZ; stream alteration law, in violation of FPA.	sediment
	3	Skid trail stabilization; landing in SPZ; slash in class I; culvert and ditch maintenance, in violation of FPA.	sediment
	6	Skid trail stabilization; skid trail in SPZ; variance for reuse of old roads; stream alteration law; culvert and ditch maintenance, in violation of FPA	sediment
	7	Landings & skid trails in SPZ; slash in class II, soil in class II, sidecast to stream, in violation of FPA.	sediment
	9	Landings & skid trails in SPZ; slash in Class I stream; stream alteration law; berms & outslope roads; sidecast out of stream, in violation of FPA.	sediment
	10	Number of skid trails excessive; drainage skid trail stabilization; plan minimum road in SPZ; minimize soft material in fills; culverts minimize erosion, in violation of FPA.	sediment

Forest Service

Four of ten federal projects were judged by the team to have an unacceptable level of BMP implementation. The main deficiency identified is that personnel who are responsible for planning and administering

projects were often insufficiently aware of the State's role in administering nonpoint source sections of the Clean Water Act. They were often unaware that the rules and regulations of the Forest Practices Act are the BMPs which provide minimum standards for compliance with the Clean Water Act. Certain Forest Service specifications on some forests are less restrictive than the BMPs, yet federal specifications are applied by sale administrators in the belief that they meet or exceed the BMPs. Another implementation problem identified is the lack of a mechanism by which a variance to the BMPs can be granted to federal land managers. Although this is not an impediment to BMP compliance, an administrative remedy for this problem should be developed.

Department of Lands

One of ten IDL projects was judged unacceptable in the implementation of BMPs. On the unacceptable project and one other project, variances were granted which resulted in the reuse of old roads and skid trails. The roads and skid trails contributed sediment to class I and II streams. A variance was used in this case, because the land manager felt compelled to maximize revenue from the project based on misinterpretation of Land Board policy. IDL should examine variances granted on its projects closely.

Forest Industry

Three of ten forest industry projects were judged to have unacceptable levels of BMP implementation. The reasons for unacceptable implementation were variable. They ranged from a lack of knowledge of the rules to failure to remain current with erosion features on a project.

Non-industrial Private

The team judged that seven of the ten non-industrial projects had unacceptable level of BMP implementation. Operators on non-industrial projects were the least familiar with the Forest Practices Act and the BMPs. These operators tend to have small projects and enter or leave the timber harvest business depending on sawlog prices. Non-industrial tracts are also small and irregular in shape. These ownership patterns and the smaller volumes produced by non-industrial private projects combine to limit skidding and yarding system options. Some owners and operators on these practices have been engaged in logging for many years and are less willing to adopt new methods which reflect the FPA rules. Stricter enforcement of FPA is required to change these entrenched

attitudes. A balanced program of information and education, technical assistance and stricter enforcement is required to correct unacceptable BMP implementation on private non-industrial lands.

An additional implementation problem particular to winter logging was noted most often on forest industry and non-industrial projects, but was also on one federal project. Often road and skid trail drainage systems were not installed prior to the spring runoff event. The problem arose because drainage features were not constructed the previous fall and could not be installed in the frozen ground.

Rule Noncompliance:

Repeated noncompliance of a specific rule may show trends and suggest causes for noncompliance. Of 59 rules pertaining to water quality, 32 of the rules were complied with in all cases. A pattern of noncompliance was observed with seven BMPs.

Table V Rules More Frequently Violated on All Ownerships

Rule	Subject	Number of Noncompliances
3D-i	Locate landings & skid trails out of SPZ	11
3E-i	Drainage skid trail stabilization by water barring	6
3G-i	Skidding in stream not permitted	5
3C-ii	30% limitation of skid trail grade on unstable soils	4
3F-i	Slash to be kept out of class I stream	4
4C-via	Stream crossing & other stream alteration law obeyed	4
4D-i	Sidecast kept out of stream channels	4
Total		36

Rule 3D-i, addressing the location of landings and skid trail out of stream protection zones, was not complied with on 11 projects. Poor planning was often responsible for the problem. Noncompliance was often associated with failure to recognize the appropriate stream class. Also failure to obtain a variance for reuse of an old skid trail or landing which encroached on a class I stream was rated as noncompliance. Technically the rule deals with new construction, however the audit team interpreted the rule to cover reuse of old landings. This rule requires further examination and clarification.

Rule 3E-i, addressing skid trail drainage and stabilization, was not complied with on 6 projects. The lack of compliance was associated with failure to have erosion control features, such as water bars, in place prior

to spring runoff after winter logging in five of these cases. This problem was specific to winter logged projects, except in 1 case where a fire break was not water barred.

Rule 3G-i, which addresses skidding through streams, was not complied with on 5 projects. These instances were often associated with the failure of planners, project administrators and operators to recognize intermittent streams as class II when they are dry.

Rules 3C-ii, which addresses the 30% limitation of constructed skid trails was not complied with on 4 projects. Some of these noncompliances stemmed from the lack of a definition of a constructed skid trail in the rules and the audit teams interpretation of the term constructed skid trail.

Rule 3F-i, which addresses keeping slash out of class I streams was not complied with on 4 projects.

Rule 4C-vi, addressing stream alteration, was not complied with on 4 projects. These violations were confined to private non-industrial projects. This ownership associated pattern indicates a lack of knowledge of the laws governing stream channel alterations. Stream channel alteration permits are administered by Idaho Department of Water Resources.

Rule 4D-i, addressing keeping sidecast from roads out of streams was not complied with on 4 projects.

Stream Impacts

Project Impacts: Fifteen of the forty inspected projects contributed minor quantities of sediment or slash to adjacent waters (Table VI). Sediment quantities delivered were typically 2-3 yards of material delivered to a class II and occasionally a class I stream. Sediment delivery exceeding 20 yards to a class I stream or its floodplain was observed on two projects. In one of these cases the stream power was sufficient to make the impact minimal, while the other sediment contribution was primarily of silty material which would rapidly be carried out of the stream. In 34 of 44 streams, the auditors observed either minimal delivery of pollutants or no pollutants delivered to streams. On a few projects extensive removal of streamside vegetation was observed. These removals of streamside vegetation could limit large

organic debris (LOD) recruitment and could hamper sediment storage capabilities of the impacted streams in the future.

Table VI. Water Quality Impacts to Class I Streams of the Projects Audited.

Impact Level	Number	Percentage
No pollutants observed to enter stream	19	43
Minimal amount of pollutants enter stream	15	34
Observers unable to gauge pollutant entry	8	18
5 unobservable due to excessive sediment from other sources		
3 unobservable due to stream velocity		
Significant sediment delivery to stream	0	0
Not Investigated	2	5
Total	44	100

Note: Some projects had more than 1 Class I stream resulting in a total of 44.

Stream Assessment: Forty-four streams were examined during the audit. Of these streams, 35 (80%) were found to be either intermediately or highly sedimented (Appendix D). Since many of the projects inspected were assessed as having no observed or minimal impact, other nonpoint source activities were considered the cause of the sedimentation. Major and minor nonpoint source activities affecting the streams were noted by the audit team (Appendix D). The percentage of the 35 intermediately or highly sedimented streams affected by a particular nonpoint source activity is given in Table VII. Roding and logging practices prior to FPA were the major causal factors identified. Roding included forest road construction as well as county roads and highways. Recreational vehicular traffic and grazing are substantial factors and agriculture had some effect.

Table VII. Other Nonpoint Source Activities Affecting the 35 Intermediately or Highly Sedimented Streams

Causal nonpoint source activities	Number	Percentage
Pre FPA Rooding	27	77%
Pre FPA logging	26	74%
Recreational vehicular traffic	10	29%
Grazing	9	26%
Natural events	7	20%
Agriculture	3	9%
Mining	2	6%
Pre FPA Forest Conversion	1	3%
Adjacent logging	1	3%
Miscellaneous (not logging related)	4	11%

Note: Percentages represent the fraction of the times a nonpoint source activity was associated with one of the 35 streams. Since more than one activity could affect a stream percentages do not add to 100%.

CONCLUSIONS AND RECOMMENDATIONS

Effectiveness of BMPs

BMPs were found to be effective in minimizing erosion and subsequent sedimentation of streams when conscientiously applied. Water quality problems occur when BMPs are not used. When the rules were followed the audit team judged the rules to be effective 99% of the time. When the rules were not followed sediment was delivered to streams 70% of the time.

Application of BMPs

Application of BMPs varied by landownership category. When summarized over all inspections individually rated BMPs were applied 93% of the time. When considered on a project basis, 15 of the 40 projects (38%) were judged by the audit team to have an unacceptable level of BMP implementation.

Non-industrial private: The greatest problem with lack of BMP compliance was identified with non-industrial private ownerships. These owners and the operators cutting timber for them tend to not implement the Forest Practices Act rules and regulations. More intensive informational, educational and technical assistance programs might insure better compliance. However, the problem appears to be the lack of sound forestry expertise in these projects. Federal, state and the forest

industry use forestry professionals in planning and administration. Private non-industrial projects, unless the project was sold to a large timber company, seldom have much application of forestry expertise until the inspection of the project by the FPA advisor for compliance. Mechanisms for assuring FPA advisor or other professional forestry input prior to timber harvest of private non-industrial tracts should be developed. A pre-notification and pre-inspection process should be considered to provide advice by the FPA advisors prior to harvest. Prior advice would solve many water quality BMP compliance problems as well as foster better forestry on private lands.

Seventy percent of the non-industrial private projects audited were judged to have unacceptable BMP compliance. The operators are provided the FPA rules when they apply for a slash compliance number. Stricter enforcement with penalties will be required to obtain compliance from operators who are not implementing the rules. An operators certification program is an option to enhance operator education and compliance.

Recommendations:

- : Develop a mechanism which requires input of professional forestry expertise prior to the start of private non-industrial projects near class I streams, important class II streams and with logging operators with a previous history of FPA noncompliance.
- : Emphasize information and education programs for forest operators.
- : Enforce the Forest Practices Act Rules and Regulations more vigorously; consider operators certification as an option to control performance.

Forest Industry: Three out of ten projects were considered to have an unacceptable level of BMP application. No uniform cause was noted. The audit team observed a generally high level of awareness and acceptance of the FPA among the forest industry land managers.

Recommendation:

- : Maintain and improve adherence to FPA by industry operators and foster its universal implementation on forest industry projects.

Department of Lands: IDL had a very high level of BMP application. Only one of ten projects was considered to have an unacceptable level of BMP application. It was evident that the land managers are keenly aware of the FPA requirements and are giving careful consideration to compliance with the Act.

Recommendations:

- : Maintain the emphasis placed on BMP compliance, which has fostered high compliance rates on state projects.
- : Examine variances to the rules more closely in locations where unacceptable impacts to water quality may occur.
- : Assure uniform interpretation of Land Board policy among forest management staff regarding balance between maximized revenue and resource protection.

Forest Service: Four out of ten projects were considered to have an unacceptable level of BMP application. This was attributed to a lack of awareness by staff of the State's role in administering nonpoint source sections of the Clean Water Act, and particularly that the FPA rules are the BMPs for forestry. This can be remedied through training. An additional need is to develop a variance procedure to document changes from the BMPs. This is not to imply that a variance is not warranted, but, it is necessary to document why changes are made and how it will result in equal or better water quality protection.

Recommendations:

- : Provide more intensive training for national forest staff on the Clean Water Act, its implementation by the state and the role of the Forest Practices Act Rules and Regulations as the BMPs.
- : Change those contract B and C clauses for timber sales to insure consistency with the standards of the FPA.
- : Provide training for field level timber staff and engineers in application of the FPA rules and regulations, with emphasis on BMP techniques.

- : Develop a procedure for obtaining FPA variances.
Incorporate variance procedures into Forest Service manual supplements for Regions 1 & 4.

Water Quality Impacts:

No significant delivery of sediment to streams was observed as a result of the audited projects. Fifteen of the forty projects contributed minor quantities of sediment or slash to adjacent waters. Of the remaining projects either no pollutants were observed to enter streams or observers were unable to gauge pollutant entry because of site specific conditions.

Eighty percent of the Class I streams examined were rated by observers as intermediately or highly sedimented. A variety of nonpoint sources were noted as impacting these streams, but, the major factor was attributed to past road construction practices (77%). Use of existing roads constructed near stream channels is the single most important factor currently contributing to water quality degradation.

Recommendations:

- : Identify existing sediment sources and means to stabilize them. This should be done by the land managers on a watershed basis.
- : Identify roads which continue to discharge sediment to streams and investigate their relocation or suitable stabilization on a case by case basis.

Evaluation of Best Management Practices:

This section is limited to the FPA rules and regulations which serve as the BMPs for forestry. Recommendations for administrative changes are covered elsewhere. The topics are organized to follow the sections of the FPA Rules and Regulations.

Rule 1 - General Definitions

Stream Class: It is difficult in many cases without the input of a fisheries biologist to identify a class I stream. Often the audit team would debate whether a stream was class I or II. An added complication to this issue is the numerous streams that have class I potential. These streams currently do not support a fishery because of sedimentation from

past nonpoint source activities or construction of artificial fish passage barriers and agricultural dewatering.

These problems could be solved by two approaches. An administrative solution is to request IDFG to identify all class I and/or potential class I streams in the state. Lists and maps of these waters could be published for use by foresters. Implementation of this remedy would be manpower intensive. Special funding of IDFG would be required. An alternate approach would require rule changes. The concept of class I and II streams would be dropped in favor of a variable stream protection zone based on the stream characteristics.

Any system developed should be straight forward, protective of the stream and easily applied by foresters and operators.

Skid Trail: The term constructed skid trail is not defined by the FPA rules. The implications of this definition are important to operators and regulators. The audit team considered a skid trail where mineral soil is exposed, whether by the blade of heavy equipment or by repeated dragging of logs, was a constructed skid trail, because it resulted in the same effect. The definition in association with the rule limiting skid trail location need to be considered by the FPA Advisory Committee.

Rule 3 - Timber Harvesting

Rule 3.d. - Location of landings, skid trails, fire trails.

The difference in interpretation of constructed verses non-constructed skid trails is discussed above. Another consideration is interpretation of the term new in these rules. Many timber harvest projects occur in areas where landings and skid trails have previously been constructed. The environmental impact of reuse of these systems may be the same as new systems if major earth moving is involved. Is it the intent of the current rules to exempt existing trails and landings that are within the Stream Protection Zone? A blanket exemption for reuse of old landings and skid trails is not justified. The intent of the rules and trade off between reuse of existing systems verses constructing new systems outside of the Stream Protection Zone should be examined by the Forest Practice Advisory Committee.

Rule 3.e. - Drainage Systems.

Wording of Rule 3.e.i. needs to be clarified to specify a timetable of stabilizing skid trails. Currently it is unclear whether erosion control work should be kept current shortly after use, for example, every two weeks, or simply before fall or spring runoff. In practice the current rule does not provide IDL a way to insure that erosion control work will be completed in a timely manner.

The audit identified several winter logging jobs which did not have proper drainage of skid trails and roads installed prior to the spring runoff event. Although winter logging generally has less impact on soils, it is difficult to install drainage structures in the frozen ground. The consequence on the projects mentioned was that drainage was not in place for the spring runoff event. The rules, which insure trail drainage, require scrutiny by the Forest Practices Advisory Committee. This also applies to erosion control on haul roads (Rule 4.d.iii.).

Rule 3.g. - Stream Protection.

Observation of several projects was that the existing stream protection rule based primarily on regulation of temperature was not appropriate. The requirement of 75% shade does not provide consideration for large organic debris recruitment. The rule should be revised to shift emphasis to the important function large woody debris provides in streams.

The rules should require flagging of class I Stream Protection Zones to prevent heavy equipment from entering this area by mistake. This is especially important for winter logging jobs where the stream features are often obscured by snow.

Rule 4 - Road Construction and Maintenance

Culverts installed on projects in Belt geology were reported to plug with large rocks. The rules governing culvert sizing, especially on Belt geology, may not be effective (Rule 4.c.vi.). The Forest Practices Advisory Committee should evaluate sizing of culverts. This should be coordinated with requirements of the Stream Channel Protection Act administered by Department of Water Resources.

A difference of opinion between managers, concerning the removal of culverts from abandoned or inactive roads was identified during the audit. Some managers believe culverts will eventually plug with debris and blow

out during peak flows. These managers believe all culverts should be pulled on road closure or abandonment. Other managers believe that pulling culverts will cause sedimentation, while the chance of a culvert plugging is not a certainty. Relief ditches constructed adjacent to and immediately downhill of some culverts may offer an alternate solution to this problem in some circumstances. Guidance from the Forest Practices Advisory Committee on this issue is needed.

APPENDIX A: Forms Used to Rate Projects Audited

5/18/88

IDAHO FOREST PRACTICE EVALUATION WORKSHEET

DATE: _____

LOCATION

SITE (Describe): _____

COUNTY _____ DESCRIPTION (Sec, T.,R, P.M. _____
OWNER _____
OPERATOR _____

FPA FOREST REGION (): North _____ South _____

USFS _____ State _____ Private Industrial _____
Private Non-industrial _____

PHYSICAL ENVIRONMENT

ELEVATION: Mean _____ Range _____
SLOPE: Mean _____ Range _____

CLIMATE: Annual Precipitation (in.) _____
Antecedent Conditions _____

GEOLOGY & SOILS: _____
(describe) _____

Hazard Rating (see attachment) _____

VEGETATION: Forest Stand _____
(describe with Riparian Vegetation _____
H.T. & sere) _____

PRACTICES

STAGE (): Road Construction _____ Harvest _____
Slash Management _____ Reforestation _____

ROADS: New Road Construction _____
Road Reconstruction: Heavy _____ Light _____
(describe) _____

include, if possible road drainage template, culvert spacing, road gradient (0-5%, 5-10%, 10%+), prism width, sideslope %, aspect, road age, erosion practices

MILES OF NEW ROAD CONSTRUCTION _____ RECONSTRUCTION _____

HARVEST:
(Acres & Yarding
System, # of
Landings

Clearcut _____
Ind. Selection _____
OSR _____

Seed Tree _____
Shelterwood _____

SITE PREPARATION
& REFORESTATION:
(Describe)

BMP COMPLIANCE & EFFECTIVENESS

	COMPLIANCE	EFFECTIVENESS	RESPONSIBILITY	REMARKS
FOREST PRACTICES ACT RULE				
3C SOIL PROTECTION				
C-1 SKIDDING EROSION				
C-2 30% LIMITATION				
C-3a # OF SKID TRAILS				
C-3b TRACTOR SIZE APPROPRIATE				
C-4 CABLE YARDING				
3D LOCATION OF LANDINGS				
D-1 LOCATE LANDINGS & SKID TRAILS OUT OF SPZ				
D-2 SIZE OF LANDINGS				
D-3 LANDING FILL STABILIZATION				
3E DRAINAGE SYSTEMS				
E-1 DRAINAGE SKID TRAILS STABILIZATION				
E-2 DRAINAGE LANDINGS STABILIZATION				
3F TREATMENT OF WASTE MATERIAL				
F-1 SLASH OUT CLASS I STREAM				
F-2 SLASH OUT CLASS II STREAM				
F-3 SOIL OUT OF SP ZONES				
F-4 OIL, FUEL OUT SP ZONES				
3G STREAM PROTECTION				
G-1 SKIDDING, STREAM XING SP ZONES				
G-2 CABLE STREAM XING SP ZONES				
G-3 SHADING, STABIL., FILTER CLASS I				
G-4 SHADING, STABIL., FILTER CLASS II				
3H SCENIC & WILDLIFE CONSIDERATION				
H-3 WET AREAS CONSIDERATION				
ADDITIONAL NOTES:				

SCALE 1

SCALE 1

SCALE 1

SCALE 2

3

SCALE 1

SCALE 4

BMP COMPLIANCE & EFFECTIVENESS

	COMPLIANCE	EFFECTIVENESS	RESPONSIBILITY	REMARKS
4 ROAD CONSTRUCTION RULES				
4B PLANS & SPECIFICATIONS				
B-1a PLAN MIN. IN SP ZONES				
B-1b PLAN VEGETATION BETWEEN ROAD & STREAM				
B-2a PLAN MIN. WIDTH CUT & FILL				
B-2b PLAN MINIMUM CUTS & FILLS NEAR STREAM CHANNELS				
B-3 PLAN WASTE TO BE STABILIZED				
B-4a PLAN ROAD DRAINAGE				
B-4b PLAN ROAD DIPS, W-BARS & XING DRAINS				
B-5a PLAN ROAD & CULVERT DITCHES				
B-5b PLAN CULVERTS EROSION OF FILL				
B-5c PLAN MIN. DISCHARGE OF SEDIMENT				
B-6a PLAN MINIMUM STREAM XINGS				
B-6b PLAN CULVERT FISH PASSAGE				
B-7 PLAN REUSE OR VARIANCE ON OLD ROADS				
4C ROAD CONSTRUCTION EXCESS MATERIAL, SLASH OUT SP ZONES				
C-1 CONSTRUCTION FOLLOWED PLAN				
C-2 DEBRIS CLEARED FROM DRAINAGEWAYS				
C-3 STABILIZE EXPOSED AREAS				
C-5 COMPACT & MINIMIZE SOFT MATERIAL IN FILLS				
C-6a STREAM XING, OTHER LAW				
C-6b ROAD CONSTRICTION OF STREAM CHANNELS				
C-7 REMOVE BERMS & OUTSLOPE ROADS				
ADDITIONAL NOTES:				

SCALE 1

SCALE 1

BMP COMPLIANCE & EFFECTIVENESS

	COMPLIANCE	EFFECTIVENESS	RESPONSIBILITY	REMARKS
FOREST PRACTICES ACT RULE				
C-8 QUARRY DRAINAGE				
C-9a X-DRAINS, CULVERTS- MIN. EROSION				
C-9b INSTALL DRAINAGE PRIOR TO RUNOFF				
C-9c RELIEF CULVERT GRADIENT				
C-10 WET WEATHER CONSTRUCTION DELAYS				
C-11 OVERHANG CUTS & TREE HAZARDS				
4D ROAD MAINTENANCE				
D-1 SIDECAST OUT OF STREAMS				
D-2 REPAIR, STABILIZE SEDIMENT HAZARDS				
D-3 ACTIVE ROADS				
3a CULVERTS, DITCHES				
3b CROWN, SLOPED BERM				
3c MINIMIZE SUBGRADE DRAINAGE EROSION				
3d SURFACE OIL OUT OF STREAM				
D4 INACTIVE ROADS				
4a CULVERTS, DITCHES, SLOPES DRAINAGE				
4b ROAD CLOSURE				
D-5 ABANDONED ROADS				
5a SLOPED, DRAINAGE, VEGETATION				
5b DITCHES CLEAN				
5c ROAD CLOSED				
5d BRIDGES, CULVERTS REMOVED				
ADDITIONAL NOTES:				

SCALE 1

SCALE 1

3

SCALE 1

OBSERVED PROTECTED USE IMPACTS
STREAM REACH DESCRIPTION

NAME: _____
REACH DESCRIPTION: _____
STREAM ORDER: _____ STREAM STAGE: _____
LENGTH OF REACH EVALUATED: _____

OBSERVED OR KNOWN BENEFICIAL USES

FISH HABITAT

FPA STREAM CLASS: I _____ II _____
FISHERY TYPE*: _____
IF&G STREAM CLASS*: _____
PRIMARY FISHERY USE**: _____
SPECIES PRESENT: _____

DOMESTIC WATER SUPPLY

DISTANCE TO INTAKE: _____

*Fishery Type: 1. Warm Water Fish, 2. Hatchery Trout with no wild trout,
3. Wild trout (with or without hatchery supplement), 4. Kokanee 5. Steelhead and/or Chinook Salmon.

*IF&G Stream Class: 1. Extremely critical, 2. Highly critical, 3. Critical,
4. Moderate, 5. Low.

** Fishery Use: Spawning, Rearing, Fish Passage, Overwintering, etc.

STREAM PROTECTION OBSERVATIONS

REACH: _____

AS A RESULT OF:	PRE-EXISTING CONDITIONS	PROJECT RELATED IMPACTS
POOL FILLING (SEDIMENT):	_____ (1-Severe; 2-moderate; 3-slight; 4-None Evident)	_____ (None; Minimal; Extensive; NA; NI)
COBBLE EMBEDDEDNESS:	_____ (1- ≥46%; 2-31-45%; 3-16-30%; 4-0-15%)	_____ (None, Minimal; Extensive; NA; NI)
SPAWNING GRAVELS SEDIMENTED:	_____ (1-highly sedimented; 2-moderate; 3-slight; 4-no observed sedimentation)	_____ (None, Minimal; Extensive; NA; NI)

STREAMBANK CONDITION: _____

1-<25% of streambank covered with vegetation or by gravel or larger material, overhanging vegetation and undercut banks absent, streambanks are receiving severe mechanical alteration;

(None; Minimal; Extensive; NA; NI)

2-25-49% of streambank covered with vegetation or by gravel or larger material, overhanging vegetation and undercut banks uncommon, streambanks are receiving moderate mechanical alteration;

3-50-79% streambank covered with vegetation or by gravel or larger material, undercut banks and overhanging vegetation moderate, streambanks receiving slight alteration;

4-over 80% of streambank covered with vegetation in good condition or by boulder/rubble, little or no soil exposed, undercut banks and overhanging vegetation abundant, no mechanical streambank alteration.

REACH: _____

AS A RESULT OF:	PRE-EXISTING CONDITIONS	PROJECT RELATED IMPACTS
POOL FILLING(SEDIMENT):	_____ (1-Severe;2 -moderate; 3-slight; 4-None Evident)	_____ (None; Minimal; Extensive; NA; NI)
COBBLE EMBEDDEDNESS:	_____ (1- ≥46%; 2-31-45%; 3-16-30%; 4-0-15%)	_____ (None, Minimal; Extensive; NA; NI)
SPAWNING GRAVELS SEDIMENTED:	_____ (1-highly sedimented; 2-moderate; 3-slight; 4-no observed sedimentation)	_____ (None, Minimal; Extensive; NA; NI)

STREAMBANK CONDITION:	_____ 1-<25% of streambank covered with vegetation or by gravel or larger material, overhanging vegetation and undercut banks absent, streambanks are receiving severe mechanical alteration; 2-25-49% of streambank covered with vegetation or by gravel or larger material, overhanging vegetation and undercut banks uncommon, streambanks are receiving moderate mechanical alteration; 3-50-79% streambank covered with vegetation or by gravel or larger material, undercut banks and overhanging vegetation moderate, streambanks receiving slight alteration; 4-over 80% of streambank covered with vegetation in good condition or by boulder/rubble, little or no soil exposed, undercut banks and overhanging vegetation abundant, no mechanical streambank alteration.	_____ (None; Minimal; Extensive; NA; NI)
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REACH: _____

AS A RESULT OF:	PRE-EXISTING CONDITIONS	PROJECT RELATED IMPACTS
POOL FILLING(SEDIMENT):	_____ (1-Severe;2 -moderate; 3-slight; 4-None Evident)	_____ (None; Minimal; Extensive; NA; NI)
COBBLE EMBEDDEDNESS:	_____ (1- ≥46%; 2-31-45%; 3-16-30%; 4-0-15%)	_____ (None, Minimal; Extensive; NA; NI)
SPAWNING GRAVELS SEDIMENTED:	_____ (1-highly sedimented; 2-moderate; 3-slight; 4-no observed sedimentation)	_____ (None, Minimal; Extensive; NA; NI)

STREAMBANK CONDITION: _____

1-<25% of streambank covered with vegetation or by gravel or larger material, overhanging vegetation and undercut banks absent, streambanks are receiving severe mechanical alteration;

(None; Minimal; Extensive; NA; NI)

2-25-49% of streambank covered with vegetation or by gravel or larger material, overhanging vegetation and undercut banks uncommon, streambanks are receiving moderate mechanical alteration;

3-50-79% streambank covered with vegetation or by gravel or larger material, undercut banks and overhanging vegetation moderate, streambanks receiving slight alteration;

4-over 80% of streambank covered with vegetation in good condition or by boulder/rubble, little or no soil exposed, undercut banks and overhanging vegetation abundant, no mechanical streambank alteration.

COMMENTS ON PROJECT IMPACTS

IMPACT TYPE: (Describe Intensity & Duration):

Sediment	_____
Temperature	_____
Loss of LOD	_____
Habitat Change	_____
Turbidity in DWS	_____

RECOMMENDATION: _____

Recommend	_____
action to	_____
prevent or	_____
mitigate	_____
problem	_____

BMP COMPLIANCE & EFFECTIVENESS SCALES

Compliance Scales

- 1 - Number or severity of noncompliance high
- 2 - Unsatisfactory - Noncompliance with rule noted
- 3 - Satisfactory - Complied with the rules
- 4 - Satisfactory - Exceeded minimum rule requirements

Effectiveness Scales

Scale 1: Sediment Delivery

- 1 - Major and prolonged quantity of sediment delivered to Class 1 stream or delivery imminent, including from Class II stream.
- 2 - a. Minor and prolonged or major and temporary sediment delivered to Class I stream or delivery imminent.
b. Major and prolonged quantity of sediment delivered to Class II stream.
- 3 - a. Minor and temporary quantity of sediment delivered to Class I stream.
b. Major and temporary or minor and prolonged quantity of sediment delivered to Class II stream.
- 4 - Significant erosion and delivery of sediment to draws or floodplains; no sediment noted to Class I or II streams.
5. Soils do not reach draws, channels or floodplains.

Scale 2: Slash Treatment

- 1 - Major quantity of slash in Class I streams.
- 2 - Minor quantities of slash in Class I stream; slash in Class II streams in quantities sufficient to depress D.O. of downstream Class I waters or with potential for transport to and blockage of downstream drainage structures.
- 3 - Slash removed from streams but likely to become entrained and transported to downstream drainage structures during stormflow.
- 4 - Slash removed or otherwise situated such that entrainment and transport are unlikely.

Scale 3: Hydrocarbon or Hazardous Waste

- 1- Hydrocarbons or hazardous wastes in streams.
- 2 - Hydrocarbons or hazardous wastes in floodplains, draws, or other locations where it could readily contaminate waters.
- 3 - Hydrocarbons or hazardous wastes isolated from streams.
- 4 - Hydrocarbons or hazardous waste not present.

Scale 4: Stream Protection (Shading)

- 1 - Stream exposed to midday direct sunlight over substantial reach(es).
- 2 - Stream exposed to midday direct sunlight for short reach(es).
- 3 - Stream exposed to midday direct sunlight occasionally.
- 4 - Little exposure to midday direct sunlight.

Wet Areas Consideration - Use scales 1, 2 & 3 and replace stream with lake, bog, swamp, seep, spring or other sources where the presence of water is indicated.

Responsibility Spectrum

- 1 - Planning
- 2 - Contracting
- 3 - Timber Sale Administrator
- 4 - Timber Operator

Hazard Rating

SLOPE: < 45% -1 45-70% -2 > 70% -3	GEOLOGIC TYPE: Hard metamorphics, glacial tills, hard sediments & basalts Soft metamorphics, soft sediments, pyroclastics & hard granitics Glacial outwash, decomposed (low clay content) granitics	-1 -2 -3
--	---	----------------

YARDING SYSTEM:

Aerial	-1
Skyline	-2
Jammer & High Lead	-3
Rubber tire tractor	-4*
Track tractor	-5*

*Reduce 50% if practice on 12 inches or more snow or frozen ground.

Hazard Rating = Slope X geologic type X yarding system range: 1-45

APPENDIX B: Protocol for Stream Quality Assessment

Appendix B - Protocol of Stream Quality Assessment

- 1) Raters walk as much of the stream course as possible including above, in and below the forest practice area.
- 2) Randomly choose 100 meter reaches of similar stream channel type (i.e. slope, substrate, etc.) in each area.
- 3) Visually evaluate pool filling, cobble embeddedness, spawning gravels sedimentation and stream bank condition in each reach.
- 4) Assign subjective rating, 1-4 for each parameter.
- 5) Record each on sheets for appropriate reach.
- 6) Note any obvious problems.
- 7) Report to whole audit team any problems and the ratings for each reach during rating of the practice.

Appendix C: Rule Noncompliance and Ineffectiveness based on Ownership

APPENDIX D: Summary of Stream Sedimentation Bank Condition, Pollution Agents and Project Impact

Appendix D- Stream Summary

STREAM	SEDIMENT IMPACTS (Low, Intermediate, High)	STREAMBANK CONDITION (Poor, Moderate, Good)	CAUSAL AGENT (Current(C)/Pre-FPA(P)) (Major(Ma)/Minor(MI))	PROJECT RELATED IMPACT (None observed, Minimal, Extensive Unobservable, Not Investigated (NI))
Anderson Creek	High	Moderate	Past roading - P, Ma Past logging - P, Ma Rain on snow event - P, Ma	Minimal
Deer Creek	Intermediate	Good	Grazing - C, Ma Past logging - P, MI Recreation - C, MI	Minimal
Silver Creek	NI	NI	Grazing - C, MI Past logging - P, MI Recreation - C, MI	NI
Schooner Creek	intermediate	Good	Grazing - C, MI Past logging - P, MI Recreation - C, MI	None observed
Steamboat Creek	Intermediate	Moderate	Rain on snow event(1974) - P, Ma Past roading - P, Ma Recreation - C, MI	Minimal
Dudley Creek	Intermediate	Moderate	Pristine upstream	Minimal
Lamb Creek	High	Poor	Grazing - C, Ma Highway & county roads - C, MI Forest fire in drainage - P, Ma Fish ponds - C, MI	None observed
Tressle Creek	Intermediate	Moderate	Abandoned main haul road - P, Ma Recreation - C, MI	Unobservable
Twin Creek	High	Good	Past logging - P, Ma Forest fire - P, Ma	Minimal
Jungle Creek	High	Good	Past logging - P, Ma Forest fire - P, Ma	Unobservable
Butte Creek	Intermediate	Moderate	Past roading - P, Ma Past logging - P, Ma Forest fire - P, Ma	None observed
Louie Creek	Intermediate	Moderate	Past roading - P, Ma Past logging - P, Ma	Minimal
Hornet Creek	Low	Good	Water Impoundment - P, MI	None observed
Placer Creek	Low	Good	Mining - P, MI	None observed
Fish Creek	High	Good	Past Roding (incl railroad) -P, Ma Past logging - P, Ma Homesite - C, MI Recreation - C, Ma	None observed
Spring Branch Creek	Intermediate	Good	Past logging - P, Ma Recreation - C, MI	None observed
Cocolalla Creek	Intermediate	Moderate	Past roading - P, Ma Past logging - P, Ma Recreation - C, MI Residences - C, MI	Minimal
Moose Creek	Intermediate	Good	Grazing - C, Ma Open pit mining - P, Ma Past roading - P, Ma Past logging - P, Ma Recreation - C, MI	None observed
Corbett Creek	High	Good	Past roading - P, Ma Past logging - P, Ma	Unobservable
W. Fk. Merry Creek	High	Good	Past roading - P, Ma Past logging - P, Ma	Unobservable
E. Fk. Trapper Creek	Intermediate	Good	Past roading - P, Ma Past logging - P, Ma	None observed
Silver Creek	High	Good	Past roading - P, Ma Past logging - P, Ma Grazing - C, Ma	Minimal

Appendix D- Stream Summary

Cedar Creek	High	Good	Past roading - P, Ma (especially Cedar Creek Road) Past logging - P, Ma	Minimal
Fawn Creek	Intermediate	Good	Past roading - P, Ma Past logging - P, Ma	None observed
Beaver Creek	Intermediate	Moderate	Past roading - P, Ma Past logging(incl railraad) - P, Ma	None observed
School Creek	NI	NI	NI	NI
Turner Creek	Intermediate	Moderate	Past roading - P, Ma Past logging - P, Ma	None observed
Benawah Creek	Intermediate	Good	Grazing - C, Ma Agriculture - C, Ma Past roading - P, Ma Past logging - P, Ma	None observed
Smith Creek	Intermediate	Good	Past roading - P, Ma Past logging - P, Ma	Unobservable
Spring Creek	High	Moderate	Past roading - P, Ma Past & current logging - P,C, Ma (on adjacent ownership)	None observed
N. Fk. Clearwater River	Intermediate	Good	Past roading - P, Ma Past logging - P, Ma Recreation - C,Mi	Minimal
Little Silver Creek	High	Good	Past roading - P, Ma Past logging - P, Ma Recreation - C,Mi	Minimal
Red Raven Creek	Intermediate	Good	Past roading - P, Ma Past logging - P, Ma	Minimal
Middle Creek	Intermediate	Good	Past roading - P, Ma Past logging - P, Ma	Minimal
Round Valley Creek	Intermediate	Moderate	Grazing - C, Ma Dewatering - C, Mi	Minimal
Little Weiser River	NI	Good	Grazing - C, Ma Road Construction - P, Ma	Unobservable
Turner Creek	Intermediate	Moderate	Past Roading - P, Ma (especially county roads) Past logging - P, Ma	Minimal
N. Fk. Coeur d'Alene River	NI	NI	Mining - P, Ma Past Roading - P, Ma Rain on snow event(1974) - P, Ma	None observed
Class II Tributary to Lake Pend Oreille	NA	NA	Past roading - P, Mi Past logging - P, Mi Grazing - C, Mi	None observed
Pack River	NI	NI	Past logging - P, Ma Forest fire in drainage - P, Ma	Unobservable
Middle Potlatch Creek	Intermediate	Poor	Agriculture - C, Ma Forest removal - P, Ma (hydrograph compression) Past logging - P, Ma	None observed
St. Maries River	Intermediate	Moderate	Grazing - C, Ma Mining - C, Mi Past logging - P, Ma	Unobservable
Corral Creek	Intermediate	Moderate	Grazing - C, Ma Agriculture - C, Ma Past logging - P, Mi Natural high runoff - C, Ma	None observed
Falls Creek	Low	Good	None	None observed

APPENDIX E: Compilation of BMP and Sediment Delivery Data by Ownership

Data Summary USFS

	A	B	C	D	E	F	G	H	I
	SALE	AREA (AC)	HAZARD RATING	BMPs APPLIED	BMPs EFFECTIVE	SEDIMENT DELIVERY	IMPLEMENTATION PROBLEMS	RULE CHANGES	OTHER NPS IMPACTS
1									
2									
3									
4	1	9000	9	Not in 1 case: Rule 3D-1, rated 2/5/1	Not in 2 cases: Rule 3E-2, rated 3/3a/1 Rule 4D-4a, rated 3/2a/1	Minor & temporary to Class I	None	None	Old logging, rain on snow event, old road system
5									
6									
7	2	2332	4.5	Not in 2 cases: Rule 3D-1, rated 2/3b/1 Rule 3G-1, rated 2/3b/4	Effective	Minor & temporary to class II	USFS personnel not recognizing dry stream with bed or banks as class II stream	None	Grazing, past logging, recreation
8									
9									
10									
11	3	6470	6.25	Not in 1 case: Rule 3G-3, rated 2/2/1	Not in 1 case: Rule 4C, rated 3/3b	Minor & Temporary Class II	Forest plan shading guidelines not meeting BMPs, require better training of USFS personnel in BMPs Variance procedure for federal land managers	None	Grazing, past timbering, recreation
12									
13									
14									
15									
16									
17	4	244	3	Not in 3 cases: Rule 3F-1, rated 2/2/3-4; Rule 3G-3, rated 2/1/1; Rule 4D-1, rated 2/3b/4	Effective	1-2 yds sediment to Class I; Minor amounts of slash	None	None	Grazing, past logging, recreation, recreation
18									
19									
20									
21	5	623	10	Not in 2 cases: Rule 3D-1, rated 2/5/-; Rule 3G-3, rated 2/2a/1	Effective	Minor & prolonged to Class I	Burning on steep slopes adjacent to SPZ; variance procedure for federal government managers	None	Past roading, recreational use, rain on snow event in 1974
22									
23									
24									
25	6	-	-	Not in 3 cases: Rule 4B-3, rated 2/2b/1; Rule 4C, rated 2/4/4; Rule 4C-3, rated 2/2b/1	Not in 1 case: Rule 4D-4a rated 3/4/1	Minor sediment to class I & II streams; 10-20 yds to flood-plain	Roads only finished after powerline installation, thus poor USFS control	Need to examine oversizing culverts in northern Idaho	None -pristine upstream
26									
27									
28									
29									
30	7	370	9.9	Applied	Effective	None	Lack of district personnel knowledge of BMPs	None	Grazing, highway & county roads, fish ponds and fire in drainage
31									
32									
33	8	265	11	Not in 2 cases: Rule 3D-1, rated 2/5/4; Rule 4C, rated 2/3b/4	Effective	Minor & temporary to class II	None	None	abandoned logging road, recreational use
34									
35									
36	9	930	10.5	Not in 4 cases: Rule 3C-2, rated 2/5/1; Rule 3D-1, rated 2/3b/1; Rule 3D-3, rated 3/3b/4; Rule 4C-3, rated 2/3b/1	Effective	Minor & prolonged to class II	IDL/DEQ/USFS need to standardize some BMPs e.g. skidding slope limit	None	Old logging, fire
37									
38									
39									
40	10	786	6	Applied	Effective	None	None	None	Past roading & logging, fire

Data Summary IDL

	A	B	C	D	E	F	G	H	I
	SALE	AREA (AC)	HAZARD RATING	BMPs APPLIED	BMPs EFFECTIVE	SEDIMENT DELIVERY	IMPLEMENTATION PROBLEMS	RULE CHANGES	OTHER NPS IMPACTS
1									
2									
3									
4	1	1380	7	Not in 4 cases: Rule 4B-1a, rated 2/3a/1;	Effective	approx. 3 yds to	Need to tighten process on granting	None	old roads and logging
5				Rule 4B-7, rated 2/3a/1; Rule 4C, rated		Class I	variances on old roads		
6				2/3a/4; Rule 4C-1, rated 2/3a/4					
7									
8	2	560	8	Applied	Effective	None	None	None	Mining, water impoundment
9									
10	3	80	4	Applied	Effective	None	None	None	Old railroad grade, homesite, logging
11									road and recreation
12									
13	4	163	7	Not in 1 case: Rule 3G-1, Rated 2/3b/4	Effective	Temporary & Minor	None	Multiple entry vs single entry	previous timber harvest, recreation
14						to Class II		should be studied	
15									
16	5	283	12	Applied	Not effective in 2 cases: Rule 4C-9b, rated	None (only to flood-	None	Require rule which will get drainage	Old logging & roads, recreation,
17					3/4; Rule 4D-2, rated 4/4	plain)		installed prior to winter logging;	residences
18								need better definition of wet draws	
19									
20	6	268	2.5	Applied	Effective (even though delivery to draw)	None (1.5 yd to draw)	None	Lakes should be treated differently	Grazing, open pit mining, past logging
21					Rule 4C-9a rated 3/4			from class I streams	& roading, recreation
22									
23	7	160	3	Not in 2 cases: Rule 3E-1, rated 2/4/4;	Not in 1 case: Rule 4C-3, rated 3/3b	Minor & temporary	Slash treatment crew must follow	Rule 3G-4 should be reviewed to	Past logging & roading
24				Rule 4D-4a, rated 2/5/4		to Class II	BMPs	account for broadcast burning of	
25								Class II SPZ	
26									
27	8	493	13.5	Applied	Effective	Minor amount to	Need to classify streams	Need to clarify if streams should be	Past roading and logging
28						Class II		managed for what they are or	
29								potentially could be as fish habitat;	
30								Could solve this problem by protect-	
31								ing streams based on width formula	
32								rather than fish use	
33									
34	9	223	8	Not in 1 case: Rule 3C-2, rated 2/5	Effective	None	None	Practice suggests 30% limitation	Old roads and logging, grazing,
35								rule should be reviewed as too	wildlife
36								stringent	
37									
38	10	640	30	Applied with variances given	Not effective in 6 cases: Rule 3C-1, rated	Considerable delivery	Multiple entry problem	None	Past roading & logging (especially
39					3/4; Rule 3C-2, rated 3/4; Rule 3D-1,	to Class II streams;			Ceder Creek Road which IDL is
40					rated 3/3b; Rule 3E-2, rated 3/4;	Main road delivering			attempting to stabilize
41					Rule 4D-3c, rated 3/1; Rule 4D-4a,	to Ceder Creek.			
42					rated 3/4				

Data Summary Non-industry

	A	B	C	D	E	F	G	H	I
	SALE	AREA (AC)	HAZARD RATING	BMPs APPLIED	BMPs EFFECTIVE	SEDIMENT DELIVERY	IMPLIMENTATION PROBLEMS	RULE CHANGES	OTHER NPS IMPACTS
1	1	80	4.5	Not in 4 cases: Rule 3D-1, rated 2/5/4;	Effective	Minor amount of	Operator not informed of rules prior	Make slash and logging rules compatible	Grazing, dewatering of stream
2				Rule 3G-1, rated 2/3a/4; Rule 3H-3,		sediment to Class I	to harvesting		
3				rated 1/4/4; Rule 4C-6a, rated 2/3a/4					
4									
5									
6	2	150	10	Not in 6 cases: Rule 3D-1, rated 2/3a/4;	Effective	Minor amounts to	Operator solved problems as he	Pre-notification rule may be	Grazing, road construction
7				Rule 3E-1, rated 2/5/4; Rule 3F-1, rated		Class I	logged often incorrectly	necessary for private non-industrial	
8				2/4/4; Rule 3F-3, rated 2/4/4; Rule				sales	
9				3H-3, rated 2/5/4; Rule 4C-6a, rated,					
10				2/3a/4					
11									
12									
13	3	20	10	Not in 5 cases: Rule 3C-1, rated 2/3a/3;	Effective	10 yds to class I	Education problem with landowner	Prernotification rule may be re-	Previous roading (especially county
14				Rule 3D-1, rated 2/5/3; Rule 3F-1, rated				quired to solve problems in ad-	roads) and logging
15				2/5/3; Rule 3G-1, rated 2/2a/4; Rule				vance on private non-industrial	
16				4D-3a, rated 2/3a/3					
17									
18	4	100	2	Applied	Effective	None	None	None	Roading, previous logging, mining
19									
20	5	200	4	Applied	Effective	None	None	None	Previous roading & logging, grazing
21									
22	6	5+	13.5	Not in 5 cases: Rule 3E-1, rated 2/5/4;	Effective	Minor sediment to	Education problem with owner	Prernotification rule may be re-	Fire & clearcut logging in basin
23				Rule 3G-1, rated 2/3a/4; Rule 4B-7,		Class I with larger		quired to solve problems in ad-	
24				rated 2/3a/4; Rule 4C-6a, rated 2/3a/4;		amount to floodplain		vance on private non-industrial	
25				Rule 4D-4a, rated 2/5/4					
26									
27	7	160	10	Not in 4 cases: Rule 3D-1, rated 2/3b/4;	Effective	Minor & temporary	None	Require clarification in case of	Agriculture, hydrograph compres-
28				Rule 3F-2, rated 2/3/4; Rule 3F-3, rated		to Class II		potential class I stream, class I or	sion due to forest removal, previous
29				2/3b/4; Rule 4D-1, rated 2/3b/4				Class II?; clarification of timing	logging
30								of erosion proofing practices,	
31								spring/fall or every 2 weeks?	
32									
33	8	20	2.5	Not in 1 case: Rule 4C-5, rated 2/3b/4	Effective	None	None	None	Grazing, mining, previous logging
34									
35	9	1000	16	Not in 5 cases: Rule 3D-1, rated 2/3a/4;	Not in 1 case: Rule 4B-7, rated 3/3b	Major & prolonged to	IDFG needs to either classify	None	Grazing, farming, previous logging
36				Rule 3F-1, rated 2/2/4; Rule 4C-6a,		Class I	streams in Clearwater area and/or		natural high runoff events of stream
37				rated 2/5/4; Rule 4C-7, rated 2/5/4;			train forestry personnel to re-		
38				Rule 4D-1, rated 2/1/4			cognize class I streams		
39									
40	10	80	10	Not in 5 cases: Rule 3C-3a, rated 2/5/4;	Effective	Minor & prolonged	Is skid trail limitation pertinent to	None	Pristine upstream
41				Rule 3E-1, rated 2/5/4; Rule 4B-1a,		to Class II	productivity, water quality or both?		
42				rated 2/3b/4; Rule 4C-5, rated 2/3b/4;			Should there be a limitation of road		
43				Rule 4C-9a, rated 2,3b,4			grade- 26% road grade observed		