Forest Practices Water Quality Audit

1992

Idaho Department
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EXECUTIVE SUMMARY

The Silvicultural Nonpoint Source Task Force audited 32 forest practices in Idaho during the fall of 1992. The audit team's task was to inspect the level of compliance with the Rules and Regulations Pertaining to the Idaho Forest Practices Act and judge whether the best management practices were effective in preventing pollutant delivery to streams. Ocular assessment of upland erosion, observation of sediment delivery pathways, and evidence of in-stream sedimentation were used to determine if a forest practice had an effect on beneficial water uses. Recommendations are presented concerning administrative procedures and regulations.

Best management practices were implemented in the majority of cases (92%). State land managers did not apply or meet the intent of the best management practices 4% of the time, industrial 6%, federal 7%, and non-industrial 11%.

About four out of five forest practices inspected had some degree of noncompliance with the rules. Most were minor departures from the intent of the best management practice. Non-industrial lands averaged three departures per forest practice--the highest among all ownership categories. State lands ranked the lowest, averaging only half the number of departures per forest practice as non-industrial lands.

When best management practices were applied, they were judged to effectively prevent pollutant delivery to streams 99% of the time. When not applied, pollutants, primarily sediment, were observed in streams three out of four times.

Of the best management practices judged to be ineffective, maintaining surface drainage on active and inactive roads were the most frequently noted. Most of these cases involved highly erosive soils.

Eighteen of the 31 forest practices (58%) were judged to have an effect. Nineteen percent delivered minor and temporary pollutants to the stream, 26% minor and prolonged or major and temporary, and 13% major and prolonged.

Recommendations were made to Idaho Department of Lands to evaluate and propose modification to the forest practices rules governing Class II stream protection zones, soil protection, road surface maintenance, stream classifications, and wet areas.

CHAPTER 1

INTRODUCTION

Background

The Federal Water Pollution Control Act Amendments of 1972, commonly referred to as the Clean Water Act, was intended by Congress to provide a means to protect and restore the quality of the nation's water resources and their beneficial uses. Section 208 of the Act authorized development of state and local nonpoint source pollution control strategies.

Idaho's Forest Practices Water Quality Management Plan was completed consistent with the intent of Section 208. It identifies the Rules and Regulations Pertaining to the Idaho Forest Practices Act (FPA) as best management practices (BMPs) for forest practices, hereafter referred to as projects (Braun 1979, Bauer et al. 1988). Idaho's BMPs are minimum standards designed to protect beneficial uses. The Forest Practices Water Quality Management Plan describes the "feedback loop" process as the basis for changing the BMPs (Bauer et al. 1988). The process refers to the use of monitoring and surveillance to determine if BMPs are effective in protecting beneficial uses. Changes are made to the BMPs when they are not effective. Idaho's Water Quality Standards and Wastewater Treatment Requirements were subsequently amended in 1980 to include reference to the FPA (IDHW 1980) and in 1987 to incorporate the feedback loop (IDHW 1987).

The audit is conducted as one measure of the effectiveness of the regulatory system in protecting beneficial uses during forest practice activities--primarily the harvest of forest tree species and associated road construction. This task is performed by the Silvicultural Nonpoint Source Task Force, hereafter referred to as the audit team, established by the Idaho Board of Health and Welfare in 1983 (Bauer et al. 1985). It was recognized in planning sessions not all questions concerning the effectiveness of BMPs in protecting beneficial uses could be answered in the format of an audit. The audit focuses on ocular assessment of upland erosion, observation of sediment delivery pathways, and evidence of in-stream sedimentation during a single on-site review. The connection between BMPs and determining an effect on beneficial uses is much more difficult and time extensive. Research into the effectiveness of management practices and in-stream monitoring of beneficial uses are needed. An audit of this nature does, however, provide a valuable qualitative evaluation of BMP implementation and effectiveness.

On-site reviews of projects in Idaho were conducted by an interdisciplinary team in 1978, 1984, and 1988. In general, researchers found current rules with recommended modifications adequate to protect water quality (Braun 1979, Bauer et al. 1985, Harvey et al. 1989). Bauer et al. (1985) reported the potential for major water quality effects exists on high hazard land types (*e.g.* steep, granitic soils). When conditions adversely affecting water quality were observed,

they were a result of inadequate implementation of the FPA, not technical unsoundness of the BMPs (Braun 1979, Bauer et al. 1985, Harvey et al. 1989). All past audits have recommended BMP modifications that would better meet the intent of the rule. As a result, BMPs have been amended by the State Board of Land Commissioners.

Purpose

The goal of the audit is to implement the feedback loop process by evaluating the effectiveness of project BMPs, either in application or function, in protecting designated beneficial uses. In this report, the audit team will identify problems and recommend solutions through changes to administrative procedure or regulations.

Objectives

1. To determine whether best management practices were implemented on forest practices.

2. To identify any best management practices implementation problems specific to a land ownership category.

3. To evaluate best management practices effectiveness in preventing pollutant delivery from forest practices to the stream.

4. To evaluate whether current forest practices negatively affect a beneficial use.

5. To determine whether site specific best management practices were implemented on stream segments of concern and whether they were more effective in preventing pollutant delivery from forest practices to the stream than standard best management practices.

6. To evaluate Class II stream protection zone effectiveness in preventing pollutant delivery from forest practices to the stream.

CHAPTER 2

METHODOLOGY

Audit Team Selection

The audit team was composed of individuals from seven interest groups. Groups represented land management agencies, regulatory agencies, and private industry as recommended by the Forest Practices Water Quality Management Plan (Bauer et al. 1988). Early planning sessions identified a need to involve non-industrial private forest owners. A representative of conservation groups was sought and declined the offer. Native Nations declined invitation as an ex officio member. Audit team members and their affiliation are listed on the title page. Participant's expertise was in the fields of forestry, hydrology, fisheries biology, and water quality.

The audit team was accompanied by observers on most on-site reviews. Typically, observers were Sale Administrators or Idaho Department of Lands (IDL) Forest Practices Advisors with knowledge of the project.

Project Selection

The audit team limited the study area to concentrate on areas of more intense logging activity. Harvey et al. (1989) reported about 92% of the state's timber volume harvested in 1987 was from the north and west. Audit team members assumed significant changes in the cutting pattern had not occurred between 1987 and 1991. Therefore, the study area consisted of forested lands north of Boise, Idaho and west of Middle Fork Salmon River (Figure 2-1).

Audit team members reached consensus on criteria for project nomination:

- land disturbance by timber harvest or road construction since 1991;
- Class I stream on the project or within 150 feet or Class II stream on the project;
- land disturbance affected an area of at least 20 acres;
- project can be reached by road;
- project must be within two hours travel time of the next closest project; and
- the audit team has permission to visit the site.

The criteria of primary importance were land disturbance by either logging or forest road building and the presence of a Class I or Class II stream. These criteria insured the close proximity of a beneficial use to potential nonpoint sources of pollution. Since projects are likely to yield the most sediment from erosion in the first few years, the team audited projects begun in the preceding two years. Projects larger than 20 acres were sought because projects of this

size limited the number of candidate projects. High timber prices have greatly increased the number of projects on small non-industrial private tracts. Elimination of these projects would not jeopardize the approach as the purpose is to evaluate BMP effectiveness not implementation. The criteria concerning access were included to expedite auditing the project. Permission to visit a site was not denied for any project.

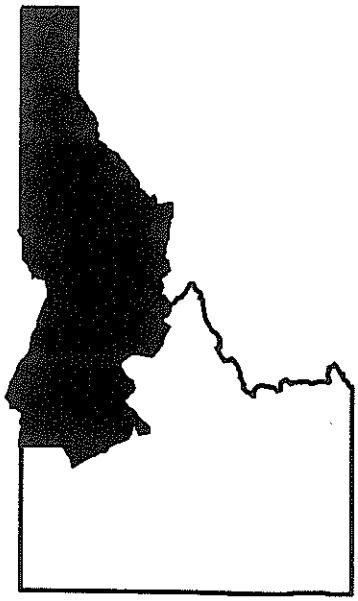

Figure 2-1. Geographic distribution of candidate forest practices for the 1992 forest practice audits.

Lists of projects that met criteria were obtained from the United States Forest Service (USFS), Bureau of Land Management (BLM), and IDL. The USFS and BLM prepared lists for federal lands they administer, and IDL prepared lists for state and private lands. Projects on private lands fell into two categories. Industrial private refers to projects on large holdings managed by corporate timber companies. Non-industrial private includes the small private tracts.

Audits were conducted in four weeks. Alternate weeks were chosen during the months of September and October. It was assumed weather would preclude on-site reviews in November. The last week of October was reserved as an alternate. Two projects were visited each day with one day of travel each week for four weeks, therefore, 32 projects were audited.

The audit team decided to allocate on-site reviews among land ownership categories proportional to the volume of timber harvested in 1991 (Table 2-1). Colla (1992) reported about 700 million board feet (mmbf) of timber was harvested from federal lands, 500 mmbf from non-industrial private lands, 400 mmbf from industrial private lands, and 200 mmbf from state lands.

On-site reviews were stratified among four geographic regions (Table 2-1). Geographic regions were based on county boundaries: north (Boundary, Bonner), north-central (Kootenai, Shoshone, Benewah), central (Latah, Clearwater, Nez Perce, Lewis, Idaho), and southwest (Adams, Valley, Washington, Payette, Gem, Boise). Geographic regions were assumed to provide soil, geologic, and administrative differences.

Table 2-1. Distribution of 1992 Idaho forest practice audits among geographic regions and land ownership categories.

	North	North-central	Central	Southwest	Total
Federal	3	3	3	3	12
Non-industrial	3	2	2	2	9
Industrial	1	2	2	2	7
State	1	1	1	1	4
Total	8	8	8	8	32

Slips representing each project by land ownership and geographic region were pooled by Idaho Division of Environmental Quality (DEQ) personnel. IDL personnel randomly drew slips until all eight slots for a geographic region were selected. Two alternates for each land ownership category and geographic region were drawn to replace projects found not to fully meet the criteria.

Verification that a project met the nomination criteria was made following its selection. The criteria were verified with the responsible agency or industry manager or IDL Forest Practices Advisor. The projects selected for on-site review are included in Table 2-2.

Rating Form

A rating form similar to the one developed by Harvey et al. (1989) was used for consistency. Minor changes were made to consider current FPA rules (Appendix A). A modified stream reach inventory and channel stability evaluation (Pfankuch 1976) was used to determine the projects effect on beneficial uses. Bank and bed conditions were assessed above and below the project. A decrease in channel stability and an absence of other point or nonpoint source pollutants would be assumed an indication of a project effect.

Table 2-2. Idaho forest practices selected for on-site review in 1992. Industrial lands indicated by Merritt were administered by Merritt Brothers Lumber, IFI by Idaho Forest Industries, LP by Louisiana Pacific, Potlatch by Potlatch Corporation, and BC by Boise Cascade.

Project Number	Ownership	Project name	County	Legal description
1	Federal	96 Tiers	Boundary	SEC 15,21,22,28 T65N R1E
2	Federal	Meadow Camp	Boundary	SEC 25,26,35,36 T64N R1E
3	Federal	Sand Creek Select	Bonner	SEC 18 T59N R1E
4	Federal	Rantenan	Kootenai	SEC 11,12,13,14 T49N R1W
5	Federal	Guard Draw	Shoshone	SEC 22,23 T50N R2E
6	Federal	Turner Down	Shoshone	SEC 11,12,13,14 T45N R6E
7	Federal	Come Back Again Sal.	Clearwater	SEC 17 T39N R2E
8	Federal	Trapper Cabin	Clearwater	T39N R7E
9	Federal	Eva Linda OSR	Idaho	SEC 21,22 T34N R6E
10	Federal	Hat-Denny Creek	Idaho	SEC 23,27,33,34 T23N R1E
11	Federal	Hazard Teepee	Idaho	SEC 18,19,30,31 T22N R2E
12	Federal	N. Kennally Salvage	Valley	SEC 13,24 T17N R4E
13	Non-industrial	#67374E	Bonner	SEC 12 T58N R1W
14	Non-industrial	#70103E	Bonner	SEC 10 T57N R3W
15	Non-industrial	#71095E	Bonner	SEC 27 T57N R1E
16	Non-industrial	#66272E	Kootenai	SEC 18 T49N R5W
17	Non-industrial	#71338E	Kootenai	SEC 1 T49N R6W
18	Non-industrial	#68748E	Latah	SEC 29 T43N R4W
19	Non-industrial	#61819E	Clearwater	SEC 5 T36N R1E
20	Non-industrial	#69203E	Boise	SEC 3,10 T8N R4E
21	Non-industrial	#62792E	Boise	SEC 31,32 T7N R5E
22	Industrial	#69137E (Merritt)	Bonner	SEC 17,18 T56N R3W
23	Industrial	#65476E (IFI)	Kootenai	SEC 27,34 T50N R5W
24	Industrial	#65117E (LP)	Shoshone	SEC 29 T49N R3E
25	Industrial	#66687E (Potlatch)	Latah	SEC 18 T42N R2E
26	Industrial	#70522E (Potlatch)	Clearwater	SEC 30 T37N R5E
27	Industrial	#66402E (BC)	Adams	SEC 3,10,15,16 T18N R2E
28	Industrial	#62826E (BC)	Boise	SEC 30 T6N R4E
29	State	Twentymile Peak Pole	Boundary	SEC 14 T60N R1E
30	State	Daveggio Pole	Shoshone	SEC 36 T45N R3E
31	State	Pierce Wall Blowdown	Clearwater	SEC 31,32 T37N R6E
32	State	Willow Creek	Boise	SEC 8,16,17,18 T6N R5E

Quality Assurance

Consistency among audit team members was desired. Due to extensive time required for the audits and evaluation of lands managed by several corporate timber companies, alternate representatives participated.

Quality assurance of the field evaluations was achieved by the use of a calibration audit. This audit was conducted prior to scheduled on-site reviews. All individuals participating in the process were required to attend. Audit team members met to discuss the BMP audit process and then evaluated a project in the field. The members shared their results with other members, identified discrepancies, and recommended ways to avoid them.

Project Inspection Protocol

Projects were inspected with a protocol developed by Harvey et al. (1989). In general, the audit team obtained an overview of the project from the responsible manager or landowner representative and studied a map of the project. Areas with the greatest potential to affect water quality and two stream reaches--one above the project and one below--were inspected. A stream reach consisted of twenty times the mean channel width. After inspections, the audit team met to discuss on-site reviews. Input from observers was considered by the audit team. Final decisions on rating the project were made by consensus of the audit team members.

The audit team rated BMP implementation by noting if the BMP, first, was applicable to the site, and then if so, whether it was applied and in the proper locations. Lack of application in at least one location was rated as noncompliance with the BMP.

The effectiveness rating answered the question, "Has the application or misapplication of a BMP increased the likelihood of, or actual occurrence of, pollutant delivery to the stream (in part, adapted from Schultz 1990)?" Lack of effectiveness could result in pollutant delivery to the stream. This is a function of distance to the stream, slope, and the density of obstructions in its path (Belt et al. 1992). The rating guide for effectiveness is based on quantity and duration of pollutant:

minor	less than five cubic yards of sediment or slash delivered to the stream;
major	more than five cubic yards of sediment or slash delivered to the stream;
temporary	lasting one year or less; and
prolonged	lasting more than one year.

Duration was chosen to represent a single age class of most aquatic life. More than one year would affect more than one age class.

Limitations of the Audit Methodology

The audit methodology consisted of a one-time field inspection and assessment. This approach documented erosion and changes in stream channel stability that occurred in the first and second year. Long term BMP effectiveness, therefore, was not evaluated.

The stream assessment was based on visual appraisal of bank and bed conditions. It was assumed a lowering of channel stability was negatively affecting beneficial uses. BMP effectiveness and in-stream monitoring are needed to show a direct cause and effect relation. The audit was not designed to provide this information.

The total number of projects meeting criteria was unknown, therefore, it is not possible to know what percentage the 32 projects represent. The percentage likely is not enough to be statistically significant. Identification of patterns was the goal, rather than quantification for statistically conclusive evidence. Observed trends in BMP compliance, administrative procedures used by land managers, and BMP effectiveness and effects on beneficial uses were representative.

On very large projects, the audit team was unable to inspect the entire project. In these cases, the team concentrated its efforts on the roads and areas immediately adjacent to streams. This approach uncovered the problems of noncompliance that have the greatest potential to affect water quality and was considered a representative sample of the project acreage.

A single management action is often regulated by several rules. In cases of BMP noncompliance or 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 noncompliance and facilitate improvement of the BMPs. As a result of this procedure, an absolute number of noncompliance can not be provided. The numbers listed are a fair comparative representation of compliance and noncompliance.

Often a BMP is applied several times on a project. Lack of application, even once, resulted in an noncompliance rating.

The assessment of pollutant delivery is conservative. In those cases where pedalstilling, rills, gullies, or mass failure were observed, the quantity of sediment could adequately be estimated. However, sediment from a large geographic area with no obvious signs of erosion was difficult to estimate. This likely resulted in more no observed and minimal project effects.

CHAPTER 3

RESULTS AND DISCUSSION

Best Management Practice Implementation

BMPs were implemented in the majority of cases (Table 3-1). Compliance with the rules varied among land ownership. State land managers did not apply or meet the intent of the BMP 4% of the time, industrial 6%, federal 7%, and non-industrial 11%. Compliance was rated on the success to fully implement a BMP. Failure to implement a BMP at just one location on a project resulted in a noncompliance rating. Harvey et al. (1989) reported similar BMP implementation rates on projects audited in 1988. Excluding federal ownership, compliance rates were much higher than reported in 1984 (Bauer et al. 1985).

Non-industrial private forest lands had the lowest BMP implementation rate. This was consistent with the findings of Bauer et al. (1985) and Harvey et al. (1989). The low compliance rate was attributed to an unfamiliarity with the FPA and a lack of professional expertise during project planning. While it is possible to remediate for a lack of BMP implementation, there is no substitute for pre-harvest planning in terms of time, money, or effectiveness.

Readers should use caution in basing their conclusions on these simple percentage ratings. About four out of five projects inspected had some degree of noncompliance with the rules. Most were a minor departure from the intent of the BMP. Individual projects varied greatly in their level of compliance. Non-industrial lands averaged three departures per project--the highest among all ownership categories. State lands ranked the lowest, averaging only half the number of departures per project as non-industrial lands.

Given the consistency of the last two audits, we believe BMP implementation rates have reached an asymptote. Higher rates seem unlikely. This conclusion is based on limitations of the sampling protocol and administrative decisions. As stated earlier, failure to implement a BMP at every opportunity resulted in a noncompliance rating. It was common for the audit team to observe, for example, a skid trail or road that needed another water bar. Both instances would result in a noncompliance rating. Changes in the "one-strike-your-out" approach would need to occur to realize higher implementation rates. Also, project planning is usually best accomplished by professional foresters and engineers. Federal, state, and industrial land owners have such staff. Non-industrial private landowners often lack this expertise. An increase in BMP implementation rates would likely require non-industrial private landowners to contract such work or receive technical assistance. Since it is unlikely such work will be contracted and unsure whether technical assistance can be provided, BMP implementation rates can be expected to remain near current levels.

Table 3-1. Best management practice compliance and effectiveness and pollutant delivery to streams when BMPs were not applied by Idaho land ownership in 1992. Numbers displayed are the simple compilation of the opportunity to apply a BMP at least once on the forest practices audited and the number of cases of noncompliance and ineffectiveness, in at least one instance.

Ownership	Number of forest practices inspected	Number of best management practices rated	Best management practice compliance		Best management practice effectiveness		Best management practice not applied and pollutants delivered to stream	
			Number	Percent	Number	Percent	Number	Percent
Federal	12	384	357	93	353	99	18	66
Non-industrial	9	243	216	89	215	99	20	74
Industrial	7	239	224	94	222	99	12	80
State	4	136	130	96	127	98	6	100
Total	32	1,002	927	92	917	99	56	75

Implementation Problems

Repeated noncompliance of a specific rule may show trends or suggest causes for noncompliance. Of 66 rules pertaining to water quality, 35 were complied with in all cases or were not encountered (Appendix B). A pattern of noncompliance was observed with eight BMPs (Table 3-2). Rules addressing the location of landings and trails out of the stream protection zone, skidding in streams, and trail stabilization were also the rules most frequently not complied with in 1988 (Harvey et al. 1989).

Table 3-2. Forest Practice Act rules frequently not complied with on all land ownerships in Idaho during 1992.

Forest Practices Act rule	Content	Number of noncompliances
3.d.i	Locate landings and trails out of the stream protection zone	6
3.g.i	Skidding in streams and temporary stream crossings	6
3.e.i	Trails stabilization	5
3.c.i	Skidding erosion and 45% skidding limitation	5
4.d.iiib	Active road--surface drainage maintenance	5
4.d.iva	Inactive road--surface drainage maintenance	4
3.f.iii	Landings and trails waste out of the stream protection zone	4
3.h.iii	Wet areas consideration	4

Location of landings or trails in the stream protection zone was often (67%) associated with failure to recognize the appropriate stream class. Mostly, this involved an inability to recognize dry channels with definite beds and banks as Class II streams. Occasionally, misclassification of a Class I stream occurred. This has been cited as a problem since 1977 (Braun 1979). At that time, a stream classification system was proposed to identify waters of high importance. The current definition of a stream states "a natural water course of perceptible extent with definite beds and banks which confines and conducts continuously or intermittently flowing water" (IDL 1992). "Definite beds are defined as having a sandy or rocky bottom which results from the scouring action of water flow." The difference between a Class I and Class II stream is the use by "few, if any, fish for spawning or rearing". This criterion leaves much interpretation to the planner, administrator, or operator. The definition requires clarification. Separation of fish-bearing and non fish-bearing waters would meet the intent of the rule. It is believed further stream delineation (*e.g.* fish-bearing waters, non fish-bearing waters, and intermittent channels) would not help stream class recognition. Rather, infractions of the rule would still persist along intermittent channels. The key is educating those implementing the

FPA. Planners and operators must be aware intermittent channels carry water and therefore sediment for short periods in the spring or fall. These streams are afforded protection under the FPA.

Tracked or wheel skidding in or through streams was observed on three projects. Once again, failure to recognize intermittent channels when they were dry as Class II streams accounted for two-thirds of the noncompliances. Also, failure to provide temporary stream crossings or suitable means to stabilize the ends of skid trails was rated as noncompliance.

Trails stabilization problems were equally distributed among skid trails, fire trails, and line skidding corridors. Harvey et al. (1989) reported the lack of rule compliance in 1988 was mostly attributed to failure to have erosion control measures in place prior to spring runoff after winter logging.

Rule 3.c.i provides for tracked or wheel skidding on slopes exceeding 45 percent gradient immediately adjacent to a Class I or Class II stream (IDL 1992). Notification to IDL is required beyond these criteria. Six percent of the projects were rated in noncompliance with this rule, and sediment was observed delivered to the stream in all cases. Amendment of this rule to prohibit tracked or wheel skidding on slopes exceeding 45 percent gradient immediately adjacent to a class I or II stream should be considered. In addition, confusion exists as to what constitutes geologically unstable, saturated, or easily compacted soils. The intent of the rule is to limit skidding if it causes, or threatens to cause, rutting, deep soil disturbance, or accelerated soil erosion. The rule should be changed to reflect such intent.

Maintaining road surface drainage was a challenge throughout the state. The problems ranged from failure to maintain drainage on active and inactive roads to discharging accumulated drainage directly to streams. A more unique situation, especially in north Idaho, was the responsibility of maintaining road drainage on public access roads (*i.e.* deeded access roads). These roads were originally constructed for commercial hauling. However, an increasing number of individuals are moving to these areas as forested land is converted to residential. As homesites are cleared and timber sold to the mill, operators are required under the FPA to provide and maintain road drainage. Once the project is completed, the responsibility of road maintenance returns to the landowners. It was not uncommon to find water bars removed by the residents for easier access. A coordinated effort by the operator, landowner, and Forest Practices Advisor should target other road users to get their cooperation in maintaining drainage structures installed by the operator. It is possible these concerns are beyond the capabilities of the FPA.

Landings and trails waste in the stream protection zone was frequently the result of noncompliance with rule 3.d.i--locating a landing or trail in the stream protection zone. As stated earlier, this most often was associated with a failure to recognize the appropriate stream class.

Half of the projects inspected required consideration of wet areas. Four were judged to be in noncompliance with the rule. Three resulted in pollutant delivery. Castelle et al. (1992) provided a synopsis of wetland buffer use and effectiveness. The literature indicated buffers reduce wetland effects by serving as biofiltration strips for sediment, nutrients, and toxic substances, moderating effects of stormwater runoff, sustaining water levels, and providing essential habitat for wetland-associated species. Effective buffers for water quality ranged from 12 to 860 feet depending on the type of disturbance and the level of effectiveness desired. Water quality and quantity benefits would require smaller buffer widths than wildlife habitat functions. Regulatory agencies generally required between 25 and 300 feet. Currently, the use of buffer strips is strictly advisory. Rules should be amended to require appropriate buffer strips be established protective of the wetland-associated functions. In no case shall this width be less than 10 feet.

Noncompliance with the aforementioned BMPs were generally distributed among all land ownerships. A BMP implementation problem may be specific to a land ownership category. Reasons for frequent noncompliance may be a lack of technical expertise, confusion of the rule, administrative decisions, et cetera.

Federal - Three BMP implementation problems could be generalized on federally owned lands: failure to comply with stream segment of concern rules; poor road drainage, both maintaining drainage on inactive roads and meeting the intent of the FPA on reused roads; and jeopardizing the integrity of Class II stabilization and filtering effects during all aspects of a forest practice (Appendix C). Practices on stream segments of concern will be discussed later in the chapter in *Site Specific Best Management Practices*.

Harvey et al. (1989) identified roads prior to the FPA as the major causal factor (77%) affecting streams in forested watersheds with nonpoint source activities. At several locations on pre-FPA roads, accumulated road drainage (*i.e.* inside ditches) was discharged directly to streams at road crossings. FPA provides for minimizing direct discharge to streams under road planning rules (IDL 1992). This is specific to new road construction. Many old roads do not meet the intent of the rules. The management agency ranked correcting such problems a low priority. They identified a lack of funding as the principal reason. A process to remediate such problems, not only on federal lands but all lands, needs to be developed for roads constructed prior to the FPA. Administration needs to recognize such problems exist and work toward procuring monies to remediate roads when reusing or reconditioning.

The lack of compliance with providing soil stabilization and water filtering effects along Class II streams was associated with activities related to the project and not timber harvest. Two projects resulted in the loss of the integrity of a Class II stream protection zone. All activities of a project--harvest of forest tree species, road construction, reforestation, the use of chemicals and fertilizers, and management of slash--should provide soil stabilization and water filtering effects along Class II streams.

Non-industrial - Problems identified by Bauer et al. (1985) and Harvey et al. (1989) continued to affect non-industrial projects (Appendix D). Entrenched in these was an unfamiliarity with the FPA. Strides have been made to narrow the gap in familiarizing operators with the FPA. This was evident by the fact BMP implementation rates have increased several percentage points with each successive audit (Bauer et al. 1985, Harvey et al. 1989). A balanced program of information and education, technical assistance, and stricter enforcement is required to continue gains in BMP compliance on non-industrial private lands.

Industrial - Two BMP implementation problems became apparent when reviewing industrial private projects (Appendix E). The first dealt with maintenance of relief culverts. During and following operations, relief culverts shall be cleared and kept functional (IDL 1992). This includes maintenance to minimize erosion of embankments.

Secondly, two projects failed to receive variances to reuse roads along Class I streams. Variances are required when practices, if applied, would result in violation of the rules. Practices authorized under a variance must provide for equal or better protection over the long term than the rules that are superseded to insure water quality and fish and wildlife habitat. In neither of these cases was mitigation provided. These problems can be corrected by providing administrative consistency in determining if variances are needed and assuring the operator must provide for equal or better protection.

State - Even though there was not a common implementation problem among state projects, one project resulted in several minor infractions (Appendix F). These departures were the result of poor road planning and landing site selection. More pre-sale planning to identify seeps or potential water quality hazards is suggested.

Best Management Practice Effectiveness

When BMPs were applied, they were judged to effectively prevent pollutant delivery to streams 99% of the time (Table 3-1). This corroborates conclusions gained in past audits, that is, when BMPs were implemented they were effective in minimizing pollutant delivery to streams (Braun 1979, Bauer et al. 1985, Harvey et al. 1989). When BMPs were not used, pollutants, primarily sediment, were observed in the streams three out of four times. This observation emphasizes the importance of strict enforcement of the FPA.

Of the BMPs found to be ineffective, maintaining surface drainage on active and inactive roads was consistently--seven out of ten times--judged to be ineffective (Appendix B). Five of the seven cases involved highly erosive soils. In one case, road surface rilling was consistently observed within five feet of properly installed water bars. In contrast to timber harvest rules, road construction and maintenance rules apply across all soil types. On unstable or highly erosive soil types, more specific BMPs may be needed to protect water quality and beneficial uses. Specific BMPs for maintaining road surface drainage on highly erosive soils should be evaluated.

Effect on Beneficial Uses

Stream assessment - Five of the 31 streams examined during on-site reviews were judged to have lower channel stability below the project (Table 3-3). The audit team determined the current project was not the major causal factor in any of the cases. Tumble Creek was affected by reduced shading from post-FPA logging. Swinnerton Gulch had a lower channel stability below the project due to a pre-FPA road in the stream protection zone. Two streams, East Fork Big Creek and an unnamed tributary, were affected by grazing. Pierce Creek had a lower rating below the project due to effects from past logging. Two streams, Tumble and Pierce creeks may have cumulative effects from forest practices.

Of the remaining streams with less than good channel stability, mining was judged to be the major casual effect. The casual effect on North Fork Rattlesnake Creek was not determinable.

The stream reach and channel stability evaluation was not sensitive enough to assess effects from current projects. Other nonpoint source activities often masked their effect.

Project effects - Eighteen of the 31 projects (58%) were judged to have an effect (Table 3-3). An effect was based on the observance of pollutants delivered to inspected waters. Nineteen percent of the projects delivered minor and temporary pollutants to the stream, 26% minor and prolonged or major and temporary, and 13% major and prolonged. Sediment quantities were typically two to three yards of material delivered to a Class II and occasionally a Class I stream.

One project, Pierce Wall Blowdown, may have improved channel stability and water quality. Past practices have supplied much bedload to the channel. This fact was supported by the stream reach evaluation. More than 50% of the bottom was judged to be in a state flux or change nearly yearlong. Landings waste in the stream may have provided low velocity areas where material could settle. Pierce Creek is a Class II stream and may be storing bedload that would have moved to Class I waters.

Site Specific Best Management Practices

Implementation - Five projects were conducted on stream segments of concern (Table 3-4). Four of these projects resulted in noncompliance with the rules. Two projects were rated not to have notified IDL of a forest practice. The other noncompliances were a failure to implement site specific BMPs.

Both noncompliances of failure to notify of a forest practice on a stream segment of concern were observed on federal lands. In addition, federal Sale Administrators accompanying the audit team on field reviews did not know the site specific BMPs. The IDL Forest Practices Act Coordinator had circulated documents identifying stream segments of concern to all district offices. In addition, federal agencies have been involved in the development of site specific BMPs on lands they administer. The Forestry Practices Appendix to the Memorandum of

Table 3-3. Summary of stream channel stability and forest practice effect on streams evaluated during the 1992 forest practice audits in Idaho.

Project number	Stream	Channel stability above	Channel stability below	Project effect
1	Mission Creek	good	good	none
2	Rock Creek	good	good	none
3			good	none
4	Service Creek		good	none
5	Guard Draw	good	good	minor-prolonged
6	Turner Creek	good	good	minor-temporary
7	Meadow Ridge Creek	good	good	minor-prolonged
8	Tumble Creek	good	fair	major-prolonged
9	Eva Creek	good	good	minor-temporary
10	Denny Creek	good	good	minor-temporary
11	Teepee Springs	good	good	minor-temporary
12	Powelson Creek		good	minor-prolonged
13	Gold Creek	good	good	minor-prolonged
14	Happy Fork Creek	good	good	minor-temporary
15		good	good	none
16	NI	NI	NI	NI
17	Jenkins Creek	good	good	major-prolonged
18	Crane Creek	good	good	minor-prolonged
19		good	good	none
20	Alder Creek	fair	good	minor-prolonged
21		poor	poor	none
22			good	none
23		good	good	none
24	Swinnerton Gulch	good	fair	major-prolonged
25	East Fork Big Creek	fair	poor	none
26	Poorman Creek	good	good	minor-prolonged
27		good	fair	major-prolonged
28	N.F. Rattlesnake Creek	fair	fair	none
29	Contrary Creek	good	good	minor temporary
30		good	good	minor prolonged
31	Pierce Creek	good	fair	none
32	Willow Creek	fair	fair	none

Table 3-4. Site specific best management practice (SSBMP) compliance and effectiveness on Idaho stream segments of concern in 1992.

Project number	Notification	SSBMP implementation	Pollutant delivery
3	No	Yes	None
9	No	Variance	None
11	Yes	No	None
13	Yes	No	Minor & prolonged to Class I.
27	Yes	Yes	None

Understanding Implementing the Nonpoint Source Water Quality Program in the State of Idaho states the federal agencies agree to comply with the water quality protection provisions of the FPA (IDHW 1993). This includes notification of a forest practice on a stream segment of concern and implementation of site specific BMPs. Federal agencies need better compliance with the FPA concerning stream segments of concern. Perhaps the notification requirement could be handled with a similar administrative procedure as for obtaining FPA variances.

Even though the notification BMP was not complied with and the Sale Administrators did not know the site specific BMPs, site specific BMPs were met. This illustrates the fact federal ownerships often exceed FPA requirements. In one case, the administrating agency became aware of the process after initiating the project and received a verbal variance to deviate from the site specific BMPs.

Effectiveness - Insufficient data exist to determine whether site specific BMPs were more effective in preventing pollutant delivery from forest practices to the stream than standard BMPs. In the two cases when site specific BMPs were implemented, the streams were classed as agricultural stream segments of concern, therefore, no site specific BMPs had been developed.

Class II Stream Protection Zone

Twenty-two Class II stream protection zones were evaluated for their effectiveness in preventing pollutant delivery from the project to the stream. One project was rejected because of numerous departures from Class II stream protection zone rules. Overall, land managers and operators provided about 45 feet of soil stabilization and water filtering effects along Class II streams (Table 3-5). Federal land managers left an average of about 50 feet, non-industrial 35, industrial 40, and state 50. Landowner objectives and operational factors such as topography, yarding method, and timber type and value influenced the width of the undisturbed area.

Table 3-5. Class II stream protection zones (feet) and breakland topography (feet) on Idaho forest practices by land ownership in 1992.

Ownership	Class II stream protection zone	Breakland topography
Federal	52	38
Non-industrial	35	23
Industrial	41	27
State	53	40
Total	46	32

The 1977 Technical Review Team, analogous to the audit team, recommended breakland topography be designated as an environmentally sensitive area for forest practices (Braun 1979). This zone is also termed the inner gorge. It is defined by the zone of steep ground between the stream and a bench of lesser slope. The audit team acted on their recommendation and judged breakland topography. The slope distance perpendicular from the edge of the stream to break-of-land was recorded. Overall, the team judged break-of-land to be about 30 feet (Table 3-5). Five projects (25%) had stream protection zones less than what the audit team judged was necessary. One explanation as to why less protection is needed on non-industrial lands is most lands are located in lower relief areas, thus, lower percent land gradients adjacent to the streams. No apparent explanation is available for industrial lands.

In addition, sediment delivery pathways were observed as part of the audit protocol. In general, sediment travel distance was less than 30 feet. This estimate is low compared to other researchers (Belt et al. 1992). Sediment delivery pathways frequently intersected streams, thus truncating the maximum travel distance. The current five feet stream protection zone contributed to the low average sediment travel distance.

Belt et al. (1992) reviewed information relating to buffer strip design for protection of water quality. They concluded variable width buffer strips have some potential to enhance the effectiveness of buffer strips. In theory, the intent of the current rule provides for variable width stream protection zones "...by leaving undisturbed soils in widths sufficient to prevent washing of sediment into Class I streams" (IDL 1992).

Thirty feet was determined by the audit team to be the average minimum distance required to prevent sediment from entering a Class II stream from a project. Non-industrial lands left the least undisturbed soil; 35 feet. Requiring a minimum Class II stream protection zone of 30 feet should not cause administrative problems in any land ownership. A variance to deviate from the standard would be recommended for those lands which present less of a threat to water quality (*i.e.* low relief areas).

CHAPTER 4

CONCLUSIONS

1. BMPs were implemented in the majority of cases. State land managers did not apply or meet the intent of the BMP 4% of the time, industrial 6%, federal 7%, and non-industrial 11%.

2. About four out of five projects inspected had some degree of noncompliance with the rules. Most were a minor departure from the intent of the BMP. Non-industrial lands averaged three departures per project--the highest among all ownership categories. State lands ranked the lowest, averaging only half the number of departures per project as non-industrial lands.

3. Rules addressing the location of landings and trials out of the stream protection zone and skidding in streams were most frequently not applied. Noncompliance was mostly (67%) associated with a failure to recognize a dry channel with bed and banks as a Class II stream.

4. Six percent of the projects were judged not to comply with the 45 percent skidding limitation immediately adjacent to streams. Sediment was observed delivered to the stream in all cases.

5. Over half of the projects required consideration of wet areas. Three (9%) resulted in pollutant delivery.

6. When BMPs were applied, they were judged to effectively prevent pollutant delivery to streams 99% of the time. When not applied, pollutants, primarily sediment, were observed in the streams three out of four times.

7. Of the BMPs judged to be ineffective, maintaining surface drainage on active and inactive roads was noted most frequently. Most of these cases involved highly erosive soils.

8. Five of the 31 streams (16%) examined during on-site reviews were judged to have lower channel stability below the project. The audit team determined the current project was not the major causal factor in any of the cases.

9. The stream reach and channel stability evaluation was not sensitive enough to assess effects from current projects. Other nonpoint source activities often masked their effect.

10. Eighteen of the 31 projects (58%) were judged to have an effect. Nineteen percent delivered minor and temporary pollutants to the stream, 26% minor and prolonged or major and temporary, and 13% major and prolonged.

11. Five projects were conducted on stream segments of concern. Four of these projects resulted in violations of the FPA.

12. Overall, land managers and operators provided about 45 feet of soil stabilization and water filtering effects along Class II streams. Federal land managers left an average of about 50 feet, non-industrial 35, industrial 40, and state 50.

13. The audit team judged breakland topography to be about 30 feet. Five projects (25%) had stream protection zones less than what the audit team judged was necessary.

CHAPTER 5

RECOMMENDATIONS

Administrative

1. We recommend project criteria reflect the need for at least one season of precipitation on the project.

Project criteria specified land disturbance by timber harvest or road construction began in 1991 or 1992. On a few occasions, projects were visited after land disturbing activities but before sufficient precipitation to allow evaluation of BMP effectiveness in preventing pollutant delivery to streams.

2. We recommend IDL expand efforts in their Forestry Assistance Programs to provide pre-operational technical assistance on non-industrial forest lands.

Non-industrial private forest lands consistently had the lowest BMP implementation rate. A lack of professional expertise during project planning is believed to contribute to the problem. Federal, state, and industrial land owners have professional foresters and engineers to provide this assistance.

3. We recommend IDL continue a balanced program of information and education for non-industrial private forest owners. Idaho Department of Fish and Game and DEQ should continue to cooperate in this effort.

Problems identified by Bauer et al. (1985) and Harvey et al. (1989) continue to affect non-industrial projects. Entrenched in these was an unfamiliarity with the FPA. Strides have been made to narrow the gap in familiarizing operators with the FPA. This is evident by the fact BMP implementation rates have increased several percentage points with each successive audit (Bauer et al. 1985, Harvey et al. 1989).

4. We recommend IDL continue a strict enforcement policy on all land ownerships.

When BMPs were applied, they were judged to effectively prevent pollutant delivery to streams 99% of the time. When BMPs were not used, pollutants, primarily sediment, were observed in the streams three out of four times.

5. We recommend a coordinated effort by the operator, land manager, and Forest Practices Advisor to develop a process to remedy road surface drainage problems.

Maintaining road surface drainage was one of the BMPs frequently not followed. Failure to maintain drainage on joint ownership roads and to meet the intent of the rules, particularly on pre-FPA roads, were cited as the reasons for noncompliance. At several locations, the audit team observed accumulated road drainage (*i.e.* inside ditches) discharged directly to the stream. At others, variances were granted without providing for equal or better water quality protection over the long term.

6. We recommend federal agencies evaluate their procedures to comply with the FPA on stream segments of concern.

Federal administrators should be aware of the requirements on stream segments of concern. IDL had circulated documents identifying stream segments of concern to all districts. In addition, federal agencies have been involved in the development of site specific BMPs on lands they administer. The Forestry Practices Appendix to the Memorandum of Understanding Implementing the Nonpoint Source Water Quality Program in the State of Idaho states the federal agencies agree to comply with the water quality protection provisions of the FPA (IDHW 1993).

Rules and Regulations

1. We recommend *Rule 1.eee.iv.* be evaluated and modifications proposed to clarify stream class delineations. Recommendations include, but are not limited to, deleting "that are used by few, if any, fish for spawning or rearing" from the Class II definition and distinguishing dry channels with "definite beds and banks" as Class II streams. The Forest Practices Act Advisory Committee subcommittee on stream classification should take the led.

BMP noncompliance on at least 12 percent of the projects could be directly attributed to failure to recognize the appropriate stream class. Mostly, this involved an inability to recognize dry channels with definite beds and banks as Class II streams. This has been cited as a problem since 1977 (Braun 1979). Occasionally, misclassification of a Class I stream occurred. The current definition leaves much interpretation to the planner, administrator, or operator.

2. We recommend *Rule 3.c.i.* be amended to prohibit skidding on slopes exceeding 45 percent gradient and immediately adjacent to a Class I or Class II stream.

Rule 3.c.i provides for tracked or wheel skidding on slopes exceeding 45 percent gradient immediately adjacent to a Class I or Class II stream (IDL 1992). Six percent of the projects were rated in noncompliance with this rule and sediment was observed delivered to the stream in all cases.

3. We recommend *rules 3.c.i.* and *3.c.ii.* be amended to replace "on geologically unstable, saturated, or easily compacted soils" with "if it causes, or threatens to cause, compaction, rutting, deep soil disturbance, or accelerated soil erosion".

Confusion exists as to what constitutes geologically unstable soils. Changes would clarify the rules and meet their intent.

4. Currently, the use of buffer strips along bogs, swamps, wet draws, et cetera are strictly advisory. We recommend *Rule 3.h.iii.* be amended to require appropriate buffer strips protective of the wetland-associated functions. In no case shall this width be less than 10 feet.

It is generally accepted wetlands have an intrinsic value for water quality and quantity as well as providing essential habitat for wetland-associated wildlife species. Half of the projects inspected required consideration of wet areas. Four were judged to be in noncompliance with the rule. Three resulted in pollutant delivery. Castelle et al. (1992) reported effective buffer strips for water quality range from 12 to 860 feet depending on the type of disturbance and the level of effectiveness desired. Widths are typically greater for wildlife values. Regulatory agencies generally require between 25 and 300 feet.

5. We recommend modification of *rules 4.d.iii.* and *4.d.iv.* to include soil specific BMPs for road construction and maintenance.

Of the BMPs judged to be ineffective, maintaining surface drainage on active and inactive roads were frequently noted. Most of the cases involved highly erosive soil types. In contrast to timber harvest rules, road construction and maintenance rules apply across all soil types.

6. We recommend *rules 1.eee.iv.* and *3.g.iv.* be amended to require the Class II stream protection zone encompass the slope distance from the ordinary high water mark to breakland topography. In no case shall this width be less than 30 feet.

The 1977 Technical Review Team, analogous to the audit team, recommended breakland topography be designated as an environmentally sensitive area for forest practices (Braun 1979). The audit team acted on their recommendation and judged breakland topography on twenty-one Class II streams throughout the state. Average distance from the stream to break-of-land was 32 feet. In addition, sediment delivery pathways were observed as part of the audit protocol. In general, sediment travel distance was less than 30 feet. This estimate is low compared to other researchers (Belt et al. 1992), but sediment delivery pathways frequently intersected streams, thus truncating the maximum travel distance. Thirty feet was determined by the audit team to be the average minimum distance required to prevent sediment from entering a Class II stream from a project. Non-industrial lands left the least undisturbed soil--35 feet--on the average. Requiring a minimum Class II stream protection zone of 30 feet should not cause administrative problems in any land ownership category.

CHAPTER 6

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CHAPTER 7

GLOSSARY

beneficial use ● any of the various uses that may be made of the water of Idaho, including, but not limited to, aquatic life, domestic water supplies, industrial water supplies, agricultural water supplies, navigation, recreation in or on the water, wildlife habitat, and aesthetics.

best management practices ● a practice or combination of practices determined to be the most effective and practicable means of preventing or reducing the amount of *nonpoint source pollution.*

erosion ● the wearing away of the landscape by water, wind, ice, or gravity to smaller particles, usually *sediment.*

forest practice ● 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.

nonpoint source pollution ● pollution discharged over a geographical area, not from one specific location.

sediment ● fragmented organic or inorganic material derived from the weathering of soil, alluvial, and rock materials; removed by *erosion* and transported by water, wind, ice, or gravity.

site specific best management practice ● a *best management practice* that is applied to and takes account of the specific factors influencing *water quality*, water quality objectives, on-site conditions, and other factors applicable to the site where a *forest practice* occurs.

stream ● a natural water course of perceptible extent with definite beds and banks that confines and conducts continuously or intermittently flowing water. Definite beds are defined as having a sandy or rocky bottom that results from the scouring action of water flow.

> Class I - used for domestic water supply or are important for the spawning, rearing, or migration of fish.
>
> Class II - usually headwater streams or minor drainages used by few, if any, fish for spawning or rearing.
>
> Class I stream protection zone - the area encompassed by a slope distance of 75 feet on each side of the ordinary high water marks.

Class II stream protection zone - the area encompassed by a minimum slope distance of five (5) feet on each side of the ordinary high water marks.

stream segment of concern ● a specific stream segment or body of water that has been designated by the Water Quality Advisory Working Committee or the Governor and published in the most current final basin area report, which is developed every three (3) years for each of the six (6) basins.

water quality ● a term used to describe the chemical, physical, and biological characteristics of water with respect to its suitability for a *beneficial use*.

APPENDIX A

Forms Used to Rate Forest Practices Audited

IDAHO FOREST PRACTICE EVALUATION WORKSHEET

DATE: _____

LOCATION

PROJECT NAME: _____

FPA FOREST REGION: North ( ) South ( ) COUNTY: _____

DESCRIPTION (Sec., T, R): _____

FEDERAL ( ) STATE ( ) PRIV. INDUST. ( ) PRIV. NON-INDUST. ( )

OWNER: _____

OPERATOR: _____

PHYSICAL ENVIRONMENT

ELEVATION (ft): Mean _____ Range _____

SLOPE (%): Mean _____ Range _____

CLIMATE: Annual Precipitation (in) _____ Aspect _____

Antecedent Conditions _____

GEOLOGY AND SOILS (describe): _____

_____

VEGETATION: Forest Stand _____

Riparian Vegetation _____

PRACTICES

STAGE: Road Construction ( ) Harvest ( )

Slash Management ( ) Reforestation ( )

MILES OF NEW ROAD CONSTRUCTION: _____ RECONSTRUCTION: _____

ROADS (Describe): _____

_____

_____

_____

_____

include culvert spacing, road slope (0-5%, 5-10%, 10%+), prism width, sideslope %, aspect, road age, erosion practices (*e.g.* rolling dips, inslope, outslope)

HARVEST (describe): Clearcut _____ Seed Tree _____ Shelterwood _____

Over Story Removal _____ Individual Selection _____

_____

_____

_____

include acres, yarding system, number of landings and locations

SITE PREPARATION AND REFORESTATION (Describe): _____

_____

HAZARD RATING: _____

(slope)(geologic type)(yarding system) Range: 1-45

Slope:		Geologic Type:	
<45%	-1	Hard metamorphics, glacial tills, hard sediments, and basalts	-1
45-70%	-2	Soft metamorphics, soft sediments, pyroclastics, and hard granitics	-2
>70%	-3	Glacial outwash, decomposed (low clay content) granitics	-3

Yarding System:

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

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

BMP COMPLIANCE AND EFFECTIVENESS

FOREST PRACTICES ACT RULE (EFFECTIVENESS SCALE)	RATING COMP	RATING EFX	COMMENTS
3.C SOIL PROTECTION (1)			
C.1 SKIDDING EROSION & COMPACTION			
45% SKIDDING LIMITATION			
C.2 30% SKID TRAIL LIMITATION			
C.3 MINIMUM SKID TRAIL WIDTH & NUMBER			
TRACTOR SIZE APPROPRIATE			
C.4 CABLE YARDING			
3.D LOCATION OF LANDINGS & TRAILS (1)			
D.1 LOCATE LANDINGS & TRAILS OUT OF SPZ			
D.2 SIZE OF LANDINGS			
D.3 LANDING FILL STABILIZATION			
3.E DRAINAGE SYSTEMS (1)			
E.1 TRAILS STABILIZATION			
E.2 LANDINGS DRAINAGE			
LANDINGS STABILIZATION			
3.F TREATMENT OF WASTE MATERIAL (2)			
F.1 SLASH & DEBRIS OUT OF CLASS I			
F.2 SLASH & DEBRIS OUT OF CLASS II			
F.3 LANDINGS & TRAILS WASTE OUT OF SPZ			
F.4 OIL & FUEL OUT OF SPZ (3)			
3.G STREAM PROTECTION (4)			
G.1 SKIDDING IN STREAMS			
TEMPORARY STREAM CROSSING			
G.2 CABLE SPZ CROSSING			
G.3A CLASS I SHADE & SOIL INTEGRITY			
G.3B CLASS I 75% SHADE			
G.3C CLASS I SPZ SHADE & FILTER			
G.3D CLASS I LOD			
G.4 CLASS II STABILIZATION & FILTER			

BMP COMPLIANCE AND EFFECTIVENESS

FOREST PRACTICES ACT RULE (EFFECTIVENESS SCALE)	RATING COMP	RATING EFX	COMMENTS
3.H MAINTENANCE OF RELATED VALUES (4)			
H.2 CRITICAL AQUATIC HABITAT			
H.3 WET AREAS CONSIDERATION			
4.B ROAD SPECIFICATIONS & PLANS (1)			
B.1 PLAN ROADS TO MINIMIZE IN SPZ			
PLAN VEGETATION ROADS & STREAMS			
B.2 PLAN TO MINIMIZE ROAD WIDTH			
PLAN TO MINIMIZE CUT & FILL			
B.3 PLAN WASTE TO BE STABILIZED			
B.4 PLAN ROAD DRAINAGE			
B.5 PLAN RELIEF CULVERTS & ROAD DITCHES			
EROSION OF FILL			
MINIMIZE SEDIMENT INTO STREAMS			
B.6A CULVERT SIZING			
B.6B RELIEF CULVERT SIZING			
B.7 PLAN MINIMUM STREAM CROSSINGS			
PLAN CULVERT FISH PASSAGE			
B.8 PLAN REUSE & VARIANCE ON OLD ROADS			
4.C ROAD CONSTRUCTION (1)			
C.1 CONSTRUCTION FOLLOWED PLAN			
C.2 DEBRIS CLEARED FROM DRAINAGEWAYS			
C.3 STABILIZE EXPOSED AREAS			
C.4 COMPACT FILL NEAR STREAMS			
MINIMIZE SOFT & WOODY FILL			
C.5 STREAM CROSSING COMPLIANCE			
NO ROAD CONSTRUCTION IN STREAMS			
ROAD CONSTRICTION OF CHANNELS			
C.6 RETAIN OUTSLOPE & REMOVE BERMS			
C.7 QUARRY DRAINAGE			

BMP COMPLIANCE AND EFFECTIVENESS

FOREST PRACTICES ACT RULE (EFFECTIVENESS SCALE)	RATING COMP	RATING EFX	COMMENTS
4.C ROAD CONSTRUCTION (CONTINUED)			
C.8 CROSS DRAINS & RELIEF CULVERTS TO MINIMIZE EROSION OF FILL			
INSTALL DRAINAGE INCOMPLETE ROADS			
RELIEF CULVERT GRADIENT			
C.9 WET WEATHER CONSTRUCTION DELAYS			
C.10 OVERHANGING CUTS			
4.D ROAD MAINTENANCE (1)			
D.1 SIDECAST OUT OF STREAMS			
D.2 REPAIR & STABILIZE SEDIMENT HAZARDS			
D.3 ACTIVE ROADS			
D.3A CULVERTS & DITCHES FUNCTIONAL			
D.3B SURFACE DRAINAGE & REMOVE BERMS			
D.3C MINIMIZE SUBGRADE EROSION			
D.3D DUST ABATEMENT OUT OF STREAM (3)			
D.4 INACTIVE ROADS			
D.4A DITCHES & CULVERTS CLEARED			
SURFACE DRAINAGE MAINTAINED			
D.4B ROAD CLOSURE			
D.5 ABANDONED ROADS			
D.5A CONTROL SURFACE EROSION			
D.5B DITCHES CLEANED			
D.5C ROAD CLOSURE			
D.5D BRIDGES & CULVERTS REMOVED			
4.E WINTER OPERATIONS (1)			
E.1 INSTALL SURFACE & CROSS DRAINAGE			
8.B NOTIFY FOREST PRACTICE ON SSOC			
8.C2A SITE-SPECIFIC BMPS			

PROJECT SUMMARY

To what extent were the BMP's applied? _____

_____

_____

Were the BMP's effective in preventing soil erosion? _____

_____

_____

Have pollutants been delivered to the stream(s) or potentially could they be? _____

_____

_____

Are there any implementation problems? _____

_____

_____

Does this project suggest any rule changes? _____

_____

_____

Does this project suggest any administrative changes? _____

_____

_____

What other nonpoint activities or natural factors are affecting the stream quality? _____

_____

Stream Class: I ( ) II ( ) Class II SPZ (ft): _____

Minimum SPZ width (ft) protective of Class II stream? _____

STREAM CHANNEL AND RIPARIAN ZONE EVALUATION WORKSHEET

STREAM NAME: _____ STREAM CLASS: I ( ) II ( )

REACH DESCRIPTION: _____ REACH LENGTH (ft): _____

ITEM RATED	STABILITY INDICATORS BY CLASSES							
RIPARIAN ZONE	**EXCELLENT**	**A**	**GOOD**	**B**	**FAIR**	**C**	**POOR**	**D**
UPPER BANKS								
Mass wasting	No evidence of past or potential mass wasting into stream channels.	6	Infrequent or very small. Mostly healed. Low future potential.	12	Moderate frequency or size. Some raw spots eroded during high flows.	18	Frequent or large. Sediment delivery nearly year long or imminent danger of same.	24
Bank protection from vegetation	>90% plant density. Vigor and variety suggests a dense, deep root mass.	2	70-90% plant density. Few species or low vigor suggests a less dense or deep root mass.	4	50-70% plant density. Fewer species or lower vigor form a discontinuous or shallow root mass.	6	<50% plant density. Still fewer species or lower vigor indicate a poor, discontinuous, or shallow root mass.	8
Stream surface shading	>75% stream surface shading.	1	50-75% stream surface shading.	2	25-50% stream surface shading.	3	Little or no stream surface shading.	4
Soil disturbance or sediment delivery	No raw soils or evidence of sediment delivery to the stream.	2	Some raw soils or slight sediment delivery to the stream.	4	Moderate raw soils or sediment delivery to the stream.	6	Raw soils abundant or obvious sediment delivery to the stream.	8
LOWER BANKS								
Bank rock content	>65% and large, angular boulders (>12") numerous.	2	40-65% and mostly small boulders to cobble (6-12").	4	20-40% and mostly in the 3-6" diameter class.	6	<20% rock fragments of gravel sizes (<3").	8
Large organic debris. (Logs longer than one-half the channel width and functioning as flow deflectors or sediment traps).	Large quantities present. Stable in all flows.	2	Moderate quantities present. Moveable by flood flows.	4	Some present. Moveable at high flows.	6	Little or none present. If present, unstable in moderate flows.	8
Cutting	Little or none evident. Infrequent raw banks generally less than 6".	4	Some; intermittently at outcurves or constrictions. Raw banks up to 12".	8	Significant. Cuts 12-24" high. Root mat overhangs or sloughing evident.	12	Almost continuous cuts; some >24". Failure of overhangs frequent.	16
BOTTOM								
Consolidation or particle packing	Assorted sizes tightly packed or overlapping.	2	Moderately packed with some overlapping.	4	Mostly a loose assortment with no apparent overlap.	6	No packing evident. Loose assortment; easily moved.	8
Scouring or deposition	<5% of the bottom affected by scouring or deposition.	6	5-30% affected. Scour at constrictions or where grades steepen. Some deposition in pools.	12	30-50% affected. Scour at obstructions, constrictions, or bends. Some filling of pools.	18	>50% of the bottom in a state of flux or change nearly year long.	24
COLUMN TOTALS								

Add values in each column for a total reach score (A)_____+(B)_____+(C)_____+(D)_____ = _____ Reach score: ≤27=excellent; 28-54=good; 55-81=fair; ≥82=poor

STREAM CHANNEL AND RIPARIAN ZONE EVALUATION WORKSHEET

STREAM NAME: _____ STREAM CLASS: I ( ) II ( )

REACH DESCRIPTION: _____ REACH LENGTH (ft): _____

ITEM RATED	STABILITY INDICATORS BY CLASSES							
RIPARIAN ZONE	**EXCELLENT**	**A**	**GOOD**	**B**	**FAIR**	**C**	**POOR**	**D**
UPPER BANKS								
Mass wasting	No evidence of past or potential mass wasting into stream channels.	6	Infrequent or very small. Mostly healed. Low future potential.	12	Moderate frequency or size. Some raw spots eroded during high flows.	18	Frequent or large. Sediment delivery nearly year long or imminent danger of same.	24
Bank protection from vegetation	>90% plant density. Vigor and variety suggests a dense, deep root mass.	2	70-90% plant density. Few species or low vigor suggests a less dense or deep root mass.	4	50-70% plant density. Fewer species or lower vigor form a discontinuous or shallow root mass.	6	<50% plant density. Still fewer species or lower vigor indicate a poor, discontinuous, or shallow root mass.	8
Stream surface shading	>75% stream surface shading.	1	50-75% stream surface shading.	2	25-50% stream surface shading.	3	Little or no stream surface shading.	4
Soil disturbance or sediment delivery	No raw soils or evidence of sediment delivery to the stream.	2	Some raw soils or slight sediment delivery to the stream.	4	Moderate raw soils or sediment delivery to the stream.	6	Raw soils abundant or obvious sediment delivery to the stream.	8
LOWER BANKS								
Bank rock content	>65% and large, angular boulders (>12") numerous.	2	40-65% and mostly small boulders to cobble (6-12").	4	20-40% and mostly in the 3-6" diameter class.	6	<20% rock fragments of gravel sizes (<3").	8
Large organic debris. (Logs longer than one-half the channel width and functioning as flow deflectors or sediment traps).	Large quantities present. Stable in all flows.	2	Moderate quantities present. Moveable by flood flows.	4	Some present. Moveable at high flows.	6	Little or none present. If present, unstable in moderate flows.	8
Cutting	Little or none evident. Infrequent raw banks generally less than 6".	4	Some; intermittently at outcurves or constrictions. Raw banks up to 12".	8	Significant. Cuts 12-24" high. Root mat overhangs or sloughing evident.	12	Almost continuous cuts; some >24". Failure of overhangs frequent.	16
BOTTOM								
Consolidation or particle packing	Assorted sizes tightly packed or overlapping.	2	Moderately packed with some overlapping.	4	Mostly a loose assortment with no apparent overlap.	6	No packing evident. Loose assortment; easily moved.	8
Scouring or deposition	<5% of the bottom affected by scouring or deposition.	6	5-30% affected. Scour at constrictions or where grades steepen. Some deposition in pools.	12	30-50% affected. Scour at obstructions, constrictions, or bends. Some filling of pools.	18	>50% of the bottom in a state of flux or change nearly year long.	24
COLUMN TOTALS								

Add values in each column for a total reach score (A)_____+(B)_____+(C)_____+(D)_____ = _____ Reach score: ≤27=excellent; 28-54=good; 55-81=fair; ≥82=poor

BMP COMPLIANCE AND EFFECTIVENESS SCALES

COMPLIANCE SCALE

Y. Compliance with the rule
N. Noncompliance with the rule

EFFECTIVENESS SCALES

Scale 1: Sediment Delivery

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

Scale 2: Slash or Debris Treatment

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

Scale 3: Hydrocarbon or Hazardous Waste

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

Scale 4: Water Protection

1. Stream, lake, or wet area exposed to midday sunlight over substantial reach(es) or major and prolonged quantity of sediment delivered to stream, lake, or wet area or delivery imminent.
2. Stream, lake, or wet area exposed to midday sunlight for short reach(es) or major and temporary or minor and prolonged quantity of sediment delivered to stream, lake, or wet area or delivery imminent.
3. Stream, lake, or wet area exposed to midday sunlight occasionally or minor and temporary quantity of sediment delivered to stream, lake, or wet area or delivery imminent.
4. Little exposure to midday sunlight or no sediment delivery to stream, lake, or wet area.

APPENDIX B

BMP Noncompliance and Ineffectiveness by Land Ownership

Appendix B. Best management practice noncompliance and ineffectiveness by land ownership category in 1992.

	Federal		Non-industrial		Industrial		State		Total	
Forest Practices Act Rule	Noncpli	Infxtive	Noncpli	Infxtive	Noncpli	Infxtive	Noncpli	Infxtive	Noncpli	Infxtive
3.c SOIL PROTECTION										
c.i Skidding erosion & compaction	1		1		2				4	
45% skidding limitation			1						1	
c.ii 30% skid trail limitation	1				1				2	
c.iii Minimum skid trail width & number			2		1				3	
Tractor size appropriate										
c.iv Cable yarding										
3.d LOCATION OF LANDINGS & TRAILS	1								1	
d.i Locate landings & trails out of SPZ	1		3		1		1		6	
d.ii Size of landings			1						1	
d.iii Landing fill stabilization										
3.e DRAINAGE SYSTEMS										
e.i Trails stabilization	3		1		1			1	5	1
e.ii Landings drainage	1						1		2	
Landings stabilization										
3.f TREATMENT OF WASTE MATERIAL										
f.i Slash & debris out of Class I	1								1	
f.ii Slash & debris out of Class II										
f.iii Landings & trails waste out of SPZ			2		1		1		4	
f.iv Oil & fuel out of SPZ										
3.g STREAM PROTECTION			1						1	
g.i Skidding in streams			2		1				3	
Temporary stream crossing			3						3	
g.ii Cable SPZ crossing	1								1	
g.iiia Class I shade & soil integrity										
g.iiib Class I 75% shade										
g.iiic Class I SPZ shad & filter										
g.iiid Class I LOD										
g.iv Class II stabilization & filter	2		1						3	
3.h MAINTENANCE OF RELATED VALUES										
h.ii Critical aquatic habitat										
h.iii Wet areas consideration	2	1	1				1		4	1
4.b ROAD SPECIFICATIONS & PLANS										
b.i Plan roads to minimize in SPZ										
Plan vegetation roads & streams										
b.ii Plan to minimize road width										
Plan to minimize cut & fill										
b.iii Plan waste to be stabilized										
b.iv Plan road drainage										
b.v Plan relief culverts & road ditches	1								1	
Erosion of fill										

Forest Practices Act Rule	Federal		Non-industrial		Industrial		State		Total	
	Noncpli	Infxtive	Noncpli	Infxtive	Noncpli	Infxtive	Noncpli	Infxtive	Noncpli	Infxtive
Minimize sediment into streams										
b.via Culvert sizing			1						1	
b.vib Relief culvert sizing										
b.vii Plan minimum stream crossings			1						1	
Plan culvert fish passage										
b.viii Plan reuse & variance on old roads	1				2				3	
4.c ROAD CONSTRUCTION										
c.i Construction followed plan			1						1	
c.ii Debris cleared from drainageways										
c.iii Stabilize exposed areas										
c.iv Compact fill near streams										
Minimize soft & woody fill							1		1	
c.v Stream crossing compliance										
No road construction in streams										
Road constriction of channels										
c.vi Retain outslope & remove berms										
c.vii Quarry drainage										
c.viii X-drains & culverts to minimize erosion of fill					1				1	
Install drainage incomplete roads										
Relief culvert gradient										
c.ix Wet weather construction delays			1						1	
c.x Overhanging cuts										
4.d ROAD MAINTENANCE	1		1						2	
d.i Sidecast out of streams	1		1		1				3	
d.ii Repair & stabilize sediment hazards	1								1	
d.iii ACTIVE ROADS										
d.iiia Culverts & ditches functional	1	1			1				2	1
d.iiib Surface drainage & remove berms	2		1		1	2	1		5	2
d.iiic Minimize subgrade erosion										
d.iiid Dust abatement out of stream										
d.iv INACTIVE ROADS										
d.iva Ditches & culverts cleared			1		1				2	
Surface drainage maintained	2	2	2	1				2	4	5
d.ivb Road closure										
d.v ABANDONED ROADS										
d.va Control surface erosion										
d.vb Ditches cleaned										
d.vc Road closure										
d.vd Bridges & culverts removed										
4.e WINTER OPERATIONS										
e.i Install surface & cross drainage										
8.b NOTIFY FOREST PRACTICE ON SSOC	2								2	
8.ciia SITE SPECIFIC BMPS	1		1						2	

APPENDIX C

Summary of BMP Noncompliance and Ineffectiveness--Federal Lands

Appendix C. Summary of best management practice noncompliance, ineffectiveness, and implementation problems and recommendations for administrative procedure or regulation changes by forest practice on Idaho federal lands in 1992.

Project No.	Best management practice noncompliance		Best management practice implementation problems	Best management practice ineffectiveness		Recommendations & comments
	FPA rule	Pollutant delivery		FPA rule	Pollutant delivery	
1	3.e.i	None	Line skidding corridor needs stabilization.	Effective	None	None
2	Complied	None	None	Effective	None	None
3	3.e.ii, 8.b	None	Notification of forest practice on SSOC--site specific BMPs met.	3.h.iii 4.d.iiia	Major/temporary sed. wet area Sediment to draw	Rule 3.h.iii should be amended to require minimum slope distance between operations and wet areas. Federal compliance with SSOC rules.
4	3.d	None	Constructed skid trail near water seepage with woody fill.	Effective	None	Constructed skid trails should meet minimum road standards. Policy from DEQ--what is domestic water supply.
5	3.e.i 4.b.v, 4.d.iiib	Sediment to draw Minor/prolonged sediment II	Poor planning of road drainage--collect and divert surface drainage before stream crossing.	Effective	None	When reusing roads, must meet or exceed FPA standards or need variance and mitigation.
6	3.f.i 3.g.ii 4.d.i	Minor slash I Minor/temporary sediment I Minor/prolonged sediment II	Road maintenance sidecast to road ditch carrying water seepage immediately above Class II.	Effective	None	Better stream classification--Class I and Class II. Rule 3.h.ii should be amended to reflect state species of special concern.
7	4.d.ii, 4.d.iva	Minor/prolonged sediment II	Poor maintenance of joint access road.	Effective	None	Administration fund road maintenance programs.
8	3.c.i, 4.d.iiia 3.g.iv 3.h.iii	None Major/prolonged sediment II Major/temporary sed. wet area	Hazard reduction jeopardized integrity of Class II stabilization and filtering effects. Better identification and protection of wet areas.	Effective	None	Rule 3.g.iv should be amended to reflect intent of all aspects of forest practice. Rule 3.h.iii should be amended to require minimum slope distance between operations and wet area. Rule 3.c.i should be amended to meet intent of rutting, deep soil disturbance, or accelerated soil erosion. Rule 3.g should be amended to include shade and LOD minimums.
9	3.d.i 3.h.iii, 8.b 4.d.iva	Minor/temporary sediment II None Minor/prolonged sediment II	Notification of forest practice on SSOC. Need variance for FPA and site specific BMPs.	Effective	None	Rule 3.h.iii should be amended to require minimum slope distance between operations and wet areas. Federal compliance with SSOC rules.
10	4.b.viii, 4.d.iiib	Minor/temporary sediment I	Noticing a need for a variance.	Effective	None	BLM should investigate procedure to handle variances at state level similar to USFS.
11	3.g.iv 8.c.iia	Minor/temporary sediment II None	Site preparation jeopardized integrity of Class II stabilization and filtering effects. Administrator did not know site specific BMPs.	4.d.iva	Minor/prolonged sediment II	Specific road drainage BMPs for highly erosive soils. Rule 3.g.iv should be amended to reflect intent of all aspects of forest practice.
12	3.c.ii, 3.e.i, 4.d	Minor/prolonged sediment II	Poor planning of road drainage--direct discharge to streams.	4.d.iva	Sediment to draw or floodplain	Specific road drainage BMPs for highly erosive soils. Identifiable rule governing direct discharge of sediment to streams as in 4.b.v when reusing or reconstructing roads. Administration fund road maintenance program.

APPENDIX D

Summary of BMP Noncompliance and Ineffectiveness--Non-industrial Lands

Appendix D. Summary of best management practice noncompliance, ineffectiveness, and implementation problems and recommendations for administrative procedure or regulation changes by forest practice on Idaho non-industrial lands in 1992.

Project No.	Best management practice noncompliance		Best management practice implementation problems	Best management practice ineffectiveness		Recommendations & comments
	FPA rule	Pollutant delivery		FPA rule	Pollutant delivery	
13	8.c.iia	Minor/prolonged sediment I	Implementing site specific BMPs.	4.d.iva	Minor/prolonged sediment I	Local working committee should address other land use activities (*e.g.* public access roads).
14	3.c.i, 3.c.iii, 3.d.ii 3.g.i, 4.b.vii, 4.c.ix	None Minor/temporary sediment II	Excessive exposed soils on landings and skid trials. Inconsistency in providing stream protection at stream crossings--temporary crossings and stabilization. Lack of road planning.	Effective	None	Pre-operational inspections. Rule 3.c.i should be amended to meet the intent of rutting, deep soil disturbance, or accelerated soil erosion. Policy from DEQ--what is a domestic water supply.
15	3.c.i, 3.g.i	None	None	Effective	None	Rule 3.c.i should be amended to prohibit skidding on slopes exceeding 45 percent gradient.
16	4.d.iva	Sediment to draw or floodplain	None	Effective	None	None
17	3.d.i, 3.g, 3.g.i, 3.g.iv, 4.d, 4.d.i, 4.d.iva 3.f.iii 3.h.iii	Major/prolonged sediment II Slash II potential blockage Minor/temporary sed. wet area	Problem recognizing dry draw with bed and banks as Class II led to landing, road maintenance, and stream protection violations. Poor road maintenance. Lack of wet area protection.	Effective	None	Pre-operational inspection and operator education. Better stream classification--dry draw and Class II. Rule 3.h.iii should be amended to require minimum slope distance between operations and wet areas.
18	3.d.i, 4.c.i, 4.d.iiib 3.f.iii 4.b.via	Minor/prolonged sediment II Minor slash II None	Road construction not following plans. Culvert sizing and installation. Identifying need for stabilization and diversion of roadside ditch drainage.	Effective	None	IDL cooperation on culvert sizing. Better stream classification--dry draw and Class II. Identifiable rule governing direct discharge of sediment to streams as in 4.b.v when constructing roads.
19	Complied	None	None	Effective	None	IDFG should delineate critical habitat.
20	3.c.iii 3.d.i, 3.e.i	None Minor/prolonged sediment II	Keep current on skid trail drainage.	Effective	None	None
21	Complied	None	None	Effective	None	None

APPENDIX E

Summary of BMP Noncompliance and Ineffectiveness--Industrial Lands

Appendix E. Summary of best management practice noncompliance, ineffectiveness, and implementation problems and recommendations for administrative procedure or regulation changes by forest practice on Idaho industrial lands in 1992.

Project No.	Best management practice noncompliance		Best management practice implementation problems	Best management practice ineffectiveness		Recommendations & comments
	FPA rule	Pollutant delivery		FPA rule	Pollutant delivery	
22	Complied	None	None	Effective	None	Rule 3.h.iii should be amended to require minimum slope distance between operations and wet draws. Better stream classification--wet draws and Class II.
23	4.d.iva	None	Maintain relief culverts.	Effective	None	None
24	4.b.viii, 4.d.i 4.c.viii, 4.diiia,	Major/prolonged sediment I Minor/temporary sediment II	Reuse of existing road violates FPA--need variance and mitigation. Poor installation and maintenance of relief culverts.	4.diiib	Major/prolonged sediment II	When obtaining a variance--must mitigate to meet or exceed the intent of the rule.
25	Complied	None	Petroleum storage within 100 feet of stream.	Effective	None	When does leaving slash for erosion control become a fire hazard.
26	3.c.iii 3.d.i 4.b.viii, 4.d.iiib	None Minor/temporary sediment I Minor/prolonged sediment I	Reuse of existing road violates FPA--need variance. Direct discharge of relief culvert to stream.	Effective	None	When reusing roads, must meet or exceed FPA standards or need variance and mitigation.
27	3.c.i, 3.c.ii 3.e.i, 3.g.i 3.f.iii	Major/prolonged sediment II Minor/temporary sediment II Slash II potential blockage	Constructed skid trials on steep slopes adjacent to stream. Problem recognizing dry channel with bed and banks as Class II.	Effective	None	Rule 3.c.i should be amended to meet the intent of rutting, deep soil disturbance, or accelerated soil erosion and prohibit skidding on slopes exceeding 45 percent gradient. Rule 3.c.ii should be amended to limit the grade of constructed skid trials, irrespective of soils, to 30 percent. Better stream classification--dry draws and Class II.
28	3.c.i	None	None	4.d.iiib	Major/temporary sediment II	Rule 3.c.i should be amended to meet the intent of rutting, deep soil disturbance, or accelerated soil erosion.

APPENDIX F

Summary of BMP Noncompliance and Ineffectiveness--State Lands

Appendix F. Summary of best management practice noncompliance, ineffectiveness, and implementation problems and recommendations for administrative procedure or regulation changes by forest practice on Idaho state lands in 1992.

Project No.	Best management practice noncompliance		Best management practice implementation problems	Best management practice ineffectiveness		Recommendations & comments
	FPA rule	Pollutant delivery		FPA rule	Pollutant delivery	
29	4.c.iv	Minor/temporary sediment II	Incorporated woody material in fill at permanent stream crossing--failed to obtain a variance.	Effective	None	Rule 3.f.ii should be amended to require slash removal above Class II stream crossings.
30	3.d.i, 3.e.ii, 3.h.iii, 4.d.iiib	Minor/prolonged sediment II	Poor planning on road and landing--failed to identify and collect water seepage. Lack of drainage maintenance. Direct discharge of inside ditch to stream.	3.e.i	Sediment to draw	More pre-sale planning to identify wet areas or potential hazards to water quality. Maintain drainage during operations. Identifiable rule governing direct discharge of sediment to streams as in 4.b.v when reusing or reconstructing roads. Rule 3.h.iii should be amended to require minimum slope distance between operations and seeps.
31	3.f.iii	Major slash II	None	4.d.iva	Minor/prolonged sediment II	Specific road drainage BMPs for highly erosive soils. Rule 3.g.iv should be amended to include shade and LOD requirements for Class II.
32	Complied	None	None	4.d.iva	Minor/temporary sediment II	Specific road drainage BMPs for highly erosive soils. Rule 3.g.iiib should be amended with minimum shade requirements for Class I--75% current shade may not protect use.

APPENDIX G

Request for Rules and Regulations Evaluation and Modification

IDAHO DEPARTMENT
OF HEALTH AND WELFARE

DIVISION OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway, Coeur d'Alene, ID 83814-2648, (208) 667-3524 Cecil D. Andrus, Governor Richard P. Donovan, Director

January 19, 1994

Stanley Hamilton, Director
Idaho Department of Lands
1215 W. State Street
Boise, Idaho 83720-7000

Dear Mr. Hamilton:

As you are aware, we are to advise you when we have determined that a Forest Practices BMP is not protecting water quality and beneficial uses. We request that Idaho Department of Lands evaluates and proposes modification to the forest practices rules in the following areas: Class II stream protection zones, soil protection, road surface maintenance, stream classes, and wet areas. As the result of the 1994 forest practices audit, we have found that the rules and regulations in these areas do not provide full protection of water quality and beneficial uses as defined in the Idaho Water Quality Standards.

Included with this letter are 5 attachments. Each attachment outlines the specific rule(s), the geographic extent, the recommendations, and the evidence for each of the areas of concern.

You may contact either Robert Steed, 1410 North Hilton, Boise, Idaho 83706, (208) 334-0534, or Brian Hoelscher, 2110 Ironwood Parkway, Coeur d'Alene, Idaho 83814, (208) 769-1422 for further information.

Sincerely,

Walton C. Poole, Ph.D.
Assistant Administrator
Community Programs

WP:RS:ldc
Attachments

cc: Jim Colla
John Heimer
Brian Hoelscher, NIRO
Robert Steed
1994 Forest Practices Audit

Attachment: FPA rule change letter

January 19, 1994

Topic:

Class II Stream Protection Zones

Specific Rules:

"Stream" definition *(Rule 1.eee.iv.)*
"Stream Protection" section *(Rule 3.g.iv.)*

Geographic Extent:

Statewide.

Recommendation:

We recommend *Rules 1.eee.iv.* and *3.g.iv.* be amended to require the Class II stream protection zone encompass the slope distance from the ordinary high water mark to breakland topography. In no case shall this width be less than 30 feet.

Evidence:

The basis of our request is supported by evidence that indicates these specific rules are not fully protecting beneficial use(s). The 1977 Technical Review Team, analogous to the audit team, recommended breakland topography be designated as an environmentally sensitive area for forest practices. The 1992 Silvicultural Nonpoint Source Task Force acted on their recommendation and judged breakland topography on twenty-one Class II streams throughout the state. Average distance from the stream to break-of-land was 32 feet. In addition, sediment delivery pathways were observed. In general, sediment travel distance was less than 30 feet. This estimate is low compared to other researchers,[1] but sediment delivery pathways frequently intersected streams, thus truncating the maximum travel distance. Although the audit was not designed to evaluate the cause and effect relation between best management practices effectiveness and beneficial uses, other researchers have documented a positive correlation between suspended sediment and a negative effect on fish and aquatic life.[2] In general, a negative effect on fisheries resources can occur with as little as a 35 ppm increase in suspended sediment.

---

1 Belt, G.H., J. O'Laughlin, and T. Merrill. 1992. Design of Forest Riparian Buffer Strips for the Protection of Water Quality: Analysis of Scientific Literature. Idaho Forest, Wildlife and Range Policy Analysis Group, University of Idaho, Report No. 8, Moscow.

2 Newcombe, C.P. and D.D. MacDonald. 1991. Effects of Suspended Sediment on Aquatic Ecosystems. North American Journal of Fisheries Management 11:72-82.

Attachment: FPA rule change letter

January 19, 1994

Topic:

Wet Areas

Specific Rule(s):

"Maintenance of Related Values" section ***(Rule 3.h.iii.)***

Geographic Extent:

Statewide

Recommendation:

Currently, the use of buffer strips along bogs, swamps, wet draws, etc., are strictly advisory. We recommend *Rule 3.h.iii* be amended to require appropriate vegetative buffer strips protective of the wetland-associated functions (*e.g.* water quality, wildlife habitat). In no case shall this width be less than 10 feet.

Evidence:

The basis of our request is supported by evidence that indicates these specific rules are not fully protecting beneficial use(s). The 1992 Silvicultural Nonpoint Source Task Force judged best management practice implementation and effectiveness on 32 operating areas throughout the state. Over half of these required consideration of wet areas. Four were judged to be in noncompliance with the rule. Three resulted in pollutant delivery. Buffer strips reduce wetland effects by serving as biofiltration strips for sediment, nutrients, and toxic substances, moderating effects of stormwater runoff, sustaining water levels, and providing essential habitat for wetland-associated species. Appropriate buffer strip widths are based on several variables, including: wetland functions and values; buffer characteristics (slope and vegetative cover); land use effects; and desired buffer functions. Water quality and quantity benefits would require smaller buffer widths than wildlife habitat functions. The literature indicates effective buffers for water quality range from 12 to 860 feet depending on the type of disturbance and the level of effectiveness desired.[3] Regulatory agencies generally require between 25 and 300 feet.

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[3] Castelle, A.J., C. Conolly, M. Emers, E.D. Metz, S. Meyer, M. Witter, S. Mauermann, T. Erickson, and S.S. Cooke. 1992. Wetland Buffers: Use and Effectiveness. Washington Department of Ecology, Olympia.

Attachment: FPA rule change letter January 19, 1994

Topic:

Soil Protection

Specific Rule(s):

Rules 3.c.i. and *3.c.ii.*

Geographic Extent:

Statewide

Recommendation:

We recommend *Rule 3.c.i.* be amended to prohibit skidding on slopes exceeding 45 percent gradient and immediately adjacent to a Class I or Class II stream. In addition, *Rules 3.c.i.* and *3.c.ii.* should be amended to meet the intent. Currently, the rules state "on geologically unstable, saturated, or easily compacted soils". This should be replaced with "if it causes, or threatens to cause, compaction, rutting, deep soil disturbance, or accelerated soil erosion".

Evidence:

The basis of our request is supported by evidence that indicates these specific rules are not fully protecting beneficial use(s). An interpretation of these rules provides for tracked or wheel skidding on slopes exceeding 45 percent gradient immediately adjacent to a Class I or Class II stream provided the operation can be conducted without causing accelerated soil erosion. The 1992 Silvicultural Nonpoint Source Task Force judged best management practice implementation and effectiveness on 32 operating areas throughout a northern section of the state. Six percent of the operating areas were in noncompliance with this rule and delivered sediment to the streams. Although the audit was not designed to evaluate the cause and effect relation between best management practices effectiveness and beneficial uses, other researchers have documented a positive correlation between suspended sediment and a negative effect on fish and aquatic life.[4] In general, a negative effect on fisheries resources can occur with as little as a 35 ppm increase in suspended sediment.

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[4] Newcombe, C.P. and D.D. MacDonald. 1991. Effects of Suspended Sediment on Aquatic Ecosystems. North American Journal of Fisheries Management 11:72-82.

Attachment: FPA rule change letter January 19, 1994

Topic:

Road Surface Maintenance

Specific Rule(s):

"Road Maintenance" section *(Rules 4.d.iii.* and *4.d.iv.)*

Geographic Extent:

Statewide

Recommendation:

In contrast to timber harvest rules, road construction and maintenance rules apply across all soil types. On unstable or highly erosive soil types, more specific best management practices may be needed to protect water quality and beneficial use(s). We recommend IDL evaluate the feasibility of developing soil specific best management practices and modify *rules 4 d iii* and *4 d iv.*

Evidence:

The basis of our request is supported by evidence that indicates these specific rules are not fully protecting beneficial use(s). The 1992 Silvicultural Nonpoint Source Task Force judged best management practice implementation and effectiveness on 32 operating areas throughout the state. When best management practices were applied, they were judged to effectively prevent pollutant delivery to streams 99 percent of the time. One best management practice, which was consistently applied and judged not to be effective in preventing pollutant delivery to the streams, was road surface maintenance on active and inactive roads. This best management practice provided for about three quarters of the ineffective rules. Although the audit was not designed to evaluate the cause and effect relation between best management practices effectiveness and beneficial uses, other researchers have documented a positive correlation between suspended sediment and a negative effect on fish and aquatic life.[5] In general, a negative effect on fisheries resources can occur with as little as a 35 ppm increase in suspended sediment.

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[5] Newcombe, C.P. and D.D. MacDonald. 1991. Effects of Suspended Sediment on Aquatic Ecosystems. North American Journal of Fisheries Management 11:72-82.

Attachment: FPA rule change letter January 19, 1994

Topic:

Stream Classes

Specific Rules(s):

"Stream" definition *(Rule 1.eee.iv.)*

Geographic Extent:

Statewide

Recommendation:

We recommend *Rule 1.eee.iv.* be evaluated and modifications proposed to clarify stream class delineations. Evaluation should include, but not be limited to, the interpretation of "few, if any, fish" and distinguishing Class II streams and dry channels with "definite beds and banks".

Evidence:

The basis of our request is supported by evidence that indicates this specific rule is not fully protecting beneficial use(s). The 1992 Silvicultural Nonpoint Source Task Force judged best management practice implementation on 32 operating areas throughout the state. Noncompliance on a minimum of 12 percent is directly attributable to the inability to correctly identify the appropriate stream class, particularly recognizing dry channels with definite beds and banks as Class II streams. In all of the cases, sediment was delivered to the stream. Although the audit was not designed to evaluate the cause and effect relation between best management practices effectiveness and beneficial uses, other researchers have documented a positive correlation between suspended sediment and a negative effect on fish and aquatic life.[6] In general, a negative effect on fisheries resources can occur with as little as a 35 ppm increase in suspended sediment. The ability to correctly identify the stream classification and provide protection would likely have decreased noncompliance and provided protection of water quality and beneficial use(s).

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[6] Newcombe, C.P. and D.D. MacDonald. 1991. Effects of Suspended Sediment on Aquatic Ecosystems. North American Journal of Fisheries Management 11:72-82.

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