Oregon Plan for Salmon and Watersheds
Oregon Coast Coho Assessment
Forestry
Prepared by Department of Forestry

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Chapter A1: Certainty that the Conservation Effort will be Implemented: Forest Practices Act

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The Oregon Department of Forestry, through the 2003 Forestry Program for Oregon (FPFO), provides certainty that the Oregon Plan will be implemented. Certainty is demonstrated through both regulatory and non-regulatory programs that are supported by landowners. Private forest land managers not only achieve a high standard of compliance with the rules, but are engaged and highly motivated to conduct Oregon Plan non-regulatory projects that go beyond the requirements.

The Forest Practices Act (FPA), the first in the nation and recognized internationally, regulates harvest practices and other forest operations to protect forest resources including timber, water, soil, and fish and wildlife habitat. A key purpose for which the law was enacted was to ensure that forest operations are conducted to meet state water quality standards adopted under the federal Clean Water Act and implemented by the Department of Environmental Quality.

Following an adaptive management program, the FPA will evolve as research and monitoring lead to a better understanding of how best to protect water quality, salmonids, and other species. The Board of Forestry is currently deliberating whether forest practices are effective in meeting water quality standards. ODF concludes that existing programs provide a level of certainty that will only improve as we apply the adaptive management process.

The FPA establishes a foundation, but landowners have demonstrated success in going beyond the requirements to improve roads to reduce sediment entering streams, improve riparian function through various riparian treatments, and to actively place large wood to improve stream complexity. In only one area has forest landowners' enthusiasm declined—the active placement of large wood.

Regulations serve to prevent harm from occurring, but non-regulatory actions are necessary to restore habitat. Stream complexity has been identified in the coho assessment as essential to the viability of coho. Forestlands provide the best opportunities to place wood for immediate benefits. However, forest landowners rarely choose this option because they believe federal permitting processes and conditions are disincentives. Ironically, our certainty is diminished only by an inability thus far for agencies to work with landowner to remove this critical barrier.

Using the federal Policy for Evaluation of Conservation Efforts (PECE) criteria, the ODF establishes in this paper the overall certainty that the Department and private forest landowners will continue to contribute to the conservation effort in significant ways.

Forest Practices Act

1. **The conservation effort, the parties to the agreement or plan that will implement the effort, and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified.**

The Conservation Effort on Private Forest Lands

The Oregon Department of Forestry (ODF) regulates forest operations on 2,919,701 acres of privately owned forestland within the ESU. The program's stewardship foresters and department staff guide forest landowners and operators on how to conduct forest operations so they are in compliance with the Forest Practices Act statutes and administrative rules. The ODF and private forestry community partners developed a set of management strategies as their commitment to participate in the Oregon Plan in 1995. The management strategies utilize both regulatory and non-regulatory actions to improve water quality and fish habitat.

The Oregon Department of Forestry Oregon Plan Work Plan describes the Oregon Plan management strategies of the state and private forestland community. Each measure identifies the activity, parties that will carry out the effort, funding level and source, monitoring, and other resources necessary for implementation. The following chapters of the plan relate to private forest landowner commitments and department programs that support the efforts of these landowners:

ODF 1: Forest Practices Research and Monitoring
ODF 3: Non-regulatory Private Landowner Activities
ODF 4: ODF Regulatory Activities
ODF 6: Assistance to Family Forest Landowners
ODF 8: Cooperative Efforts in Information, Assistance, and Education

ODF 1: Forest Practices Research and Monitoring

The Private and Community Forest Program (PCF) Research and Monitoring Program conduct studies and surveys to monitor forest conditions in Oregon and to expand scientific knowledge. Areas of study have included topics such as monitoring fish presence, shade conditions above streams, compliance with best management practices, and compliance and effectiveness of forest practice rules. Findings have been presented to advisory committees made up of a diverse group of public stakeholders who make recommendations to the Board of Forestry and the State Forester about implementing potential changes to the Forest Practices Act rules.

ODF 3: Non-regulatory Component of the Plan

Private forest landowners, represented by the Oregon Forest Industries Council, Oregon Small Woodlands Association, Oregon Forest Resources Institute, OSU Extension Service, Associated Oregon Loggers and others, developed a set of non-regulatory measures as their commitment prior to and as an ongoing part of the Oregon Plan. The forestry community's non-regulatory measures include actions to improve roads, provide for fish passage, enhance fish habitat through the active placement of large wood during harvest operations, and actively manage streamside forests to accelerate improved riparian function. Training programs are available to keep landowners and operators informed about new information. Each non-regulatory measure is described in the plan, along with a schedule for completion and methods for evaluation, in the June 2000 Oregon Plan Work Program. ODF stewardship foresters, ODFW habitat biologists, OWEB, DEQ staff and OSU Extension Service and Associated Oregon Loggers assist landowners in meeting their Oregon Plan objectives (FPA Attachment 4).

ODF 4: Regulatory Component of the Plan

Executive Order 99-01, Section (3)(c) directed the Oregon Department of Forestry to determine, with the assistance of an advisory committee, to what extent changes to forest practices are needed to

meet state water quality standards and to protect and restore salmonids. A substantial body of information was developed that included:

- Independent Multidisciplinary Science Team (IMST) Technical Report 1999-1 regarding the role of forest practices and forest habitat in protecting and restoring salmonids (IMST 1999). FPA Appendix A provides the IMST recommendations and ODF responses to date.
- In accordance with Executive Order No. EO 99-01, the Board of Forestry created the Forest Practices Advisory Committee (FPAC). The FPAC was asked to determine what, if any, changes to forest practices are necessary to meet water quality standards and restore salmonids and to make specific recommendations. The Forest Practices Advisory Committee Report provides detailed information about the committee's work and recommendations (Appendix 2) (FPAC 2000).
- A series of monitoring projects that addressed roads, fish passage, landslides, riparian function and compliance were completed to assist the FPAC and others in evaluating forest practices.
- Rule Development Overview: Rules related to landslides, and roads have been adopted by the Board of Forestry and became effective January 1, 2003, while water protection, riparian functions and fish passage riparian rule modifications have since April 2003 been deliberated by the Board of Forestry. FPA Attachments 1and 3 provide an overview of the rule development progress to date.

ODF 6: Assistance to Family Forest Landowners & ODF 8: Cooperative Efforts in Information, Assistance, and Education

The Department of Forestry provides assistance to forest landowners for the management of natural resources, such as forest health, timber, fish and wildlife habitat, soil and water quality, recreation opportunities and aesthetics on private, state, and local forestland, and in Oregon's cities and communities. The Department of Forestry provides a variety of information, incentive, and services to equip forest managers with knowledge, skills, abilities, and motivation to voluntarily invest in their land and forest resources. Technical, educational, and financial assistance is delivered through a variety of partners.

Parties to the Plan

The private forestry community Oregon Plan parties to the agreement include:

- Private forestry community including Oregon Forest Industries Council members, Oregon Small Woodlands Association members & other private forest landowners
- Associated Oregon Loggers, Oregon Forest Resources Institute, OSU Extension
- ODF and sister agencies integral to the development and implementation of these Oregon Plan measures: ODFW, DEQ, & OWEB. Of particular importance in implementing private forestland actions are the ODFW habitat biologist and ODF's Private and Community Forests Program stewardship foresters.

Table 1 provides a "snapshot in time" for staffing, funding levels, and source of funding for the ESU.

Table 1 - Staffing, Funding Level, Funding Source, and Other Resources

ODF Private & Community Forest Program Stewardship Foresters 03-04 within the ESU						
District	Stewardship Forester Positions	Total District Acres	District ESU Acres	Percent of District Acres	Total Budget	ESU Budget
Coos	5	2,361,757	1,491,811	63	$355,689	$224,084
Astoria	2	499,665	268,800	54	116,647	62,989

Tillamook	1	622,500	614,340	99	74,079	73,338
Forest Grove	6	955,043	338,548	35	272,259	95,291
West Lane	4	1,073,540	842,113	78	209,778	163,627
West Oregon	5	1,339,211	803,628	60	382,732	229,639
Southwest	2	2,896,196	24,443	1	130,620	1,306
Douglas	3	2,687,962	2,555,993	95	250,778	238,239
Total	**28**	**12,435,874**	**6,939,675**	**61**	**1,792,582**	**1,088,514**

Gross budget estimates based on the percent of acres within the district that are located in the Coho ESU.

2. The legal authority of the parties to the agreement of the plan to implement the formalized conservation effort, and the commitment to proceed with the conservation effort are described.

Legal Authority

The Oregon Forest Practices Act, adopted in 1971, encourages economically efficient forest practices consistent with the protection of forest resources including timber, water, soil, and fish and wildlife habitat. A key purpose for which the law was enacted was to ensure that forest operations are conducted to meet state water quality standards adopted under the federal Clean Water Act and implemented by the Department of Environmental Quality. The Forest Practices Act promotes compliance through prevention and education, but it is also enforceable through both criminal and civil processes. Under either approach, operators are required to repair damage to the extent practicable. Monitoring studies of forest practices show high levels of compliance with the laws (Dent 2002).

ODF's compliance study deals with the complexity of the FPA rules, landowner diversity, and water quality issues with a statistically reliable study design. The study was not designed to answer questions at the ESU scale—only at the State scale. Providing results at the ESU scale would not only take a lot of additional analyses of the data, bit it would not be technically sound to do so. So we present our results in those terms (state scale). Note that the report compares enforcement data (inspections and citations) to results of random surveys. An interpretation of trends in compliance is provided in the ODF B Chapters and Technical Reports. The Executive Summary of the report is included in Appendix D of this report. The full report can be found on ODF's web site.

The FPA sets standards for any commercial activity involving the establishment, management or harvesting of trees on Oregon's forestlands. It regulates these forest operations on all non-federal lands (private, state-owned, and county- or city-owned). Operations on lands managed by the USDA Forest Service and USDI Bureau of Land Management are not directly regulated but their management plans are assumed to meet or exceed the Oregon Forest Practices Act requirements.

Commitment to Proceed

The Oregon Board of Forestry, under Oregon Revised Statutes Chapter 527, has exclusive authority to promulgate administrative rules to implement the Forest Practices Act. The Board of Forestry, through the 2003 Forestry Program for Oregon (FPFO), provides strategic direction for the Oregon Department of Forestry. Under the FPFO the Forest Practices Act is viewed as the primary means to protect soil productivity and water quality. The board also promotes ongoing non-regulatory resource restoration and enhancement efforts by forest landowners through the Oregon Plan and has explicitly stated this commitment in the FPFO.

Private forest landowners are regulated in many ways. The FPA sets standards for timber harvesting, road construction and maintenance, application of chemicals, disposal of slash, reforestation, and water protection. These lands already provide many public benefits, such as sustaining watershed health, keeping the land in forest cover, and contributing to the vibrancy of rural communities. Therefore, one of the guiding principles of the FPFO is to support cooperation and incentives as the preferred tools for promoting desired public benefits on private lands.

Private forest landowners have developed a set of non-regulatory actions as their commitment to the plan. Landowners are more likely to implement and support actions which they have developed themselves and that make sense to them. Although the non-regulatory components of the plan are implemented at the discretion of the landowner, the numbers of activities, reported in the OWEB Watershed Restoration Inventory, provide evidence of their commitment to proceed (Table 2, Figure 1, and Table 3). Not all actions should be implemented at every site and the landowner can choose those which are most likely to have a positive beneficial impact. The ODFW habitat biologists and ODF stewardship foresters provide assistance to landowners in determining what measures to implement to meet the landowners' Oregon Plan objectives.

The Oregon Plan has evolved to integrate concepts of sustainability. A central concept of sustainability is a belief that we can do more to protect the environment when we find ways to integrate environmental, economic and social values. By understanding the economic, environmental and social objectives of the landowner and the watershed context within which the actions are to be applied, the State of Oregon achieves a high level of certainty that these non-regulatory actions will be implemented and applied appropriately.

The tables below provide insight into the numbers of non-regulatory projects that managers of privately-owned forests have been conducting since the inception of the Oregon Plan to improve roads, place large wood and improve riparian functioning. Table 2 provides a summary of non-regulatory road work that has been a major contribution of industrial forest landowners. Roadwork required by the FPA is not included in the table. Road work which is necessary for a harvest operation is required by the FPA, while reconstruction of roads built prior to the rules is considered non-regulatory. Knowing this makes the numbers of actions reported even more impressive. Oregon's industrial forest managers fund the majority of roadwork reported, which leaves more OWEB dollars and other funding for many other landowners to do work on their lands who may not otherwise have the resources to do this work. Non-industrial landowners also make non-regulatory improvements to roads, which would make the figures presented even higher. In addition, it is likely that not all non-industrial landowners are reporting actions completed. The department is working to improve the service we provide landowners so that they can receive full recognition for their admirable efforts.

The numbers of road actions reported seems to be decreasing in recent years. It is unknown whether the decrease means that initial road work is nearing completion, or whether enthusiasm to report has declined. Further analysis and improvements in gauging success are needed to determine when the goal of the Road Erosion and Risk Project has been completed.

Stakeholders involved in the coho assessment have expressed concern that if coho were not listed that landowners would lose interest in participating in the Oregon Plan. This has not been the case with past listing decisions. In fact, the Oregon Plan has sustained a high level of involvement from the

private forest landowner segment since inception of the Plan regardless of listing status under the federal ESA.

Forestlands provide an important means to introduce stream complexity as natural riparian processes deliver wood to streams over time. Immediate benefits, through the active placement of large wood are possible, but landowners rarely choose to conduct these actions because federal permit processes and conditions have had a chilling effect on their enthusiasm and willingness to do these types of projects. Over the past five years the state has attempted a number of strategies (Regional General Permit, State Programmatic General Permit for Stream Restoration, and working toward state assumption of section 404 of the federal Water Pollution Control Act) to streamline and improve permit processes related to removal fill issues; however the disincentives for the private forest landowner have yet to be fully addressed. Landowners have explained that the disincentives in the federal permits stem from U. S. Fish and Wildlife Service and U. S. National Marine Fisheries biological opinions and consultations with the U. S. Army Corps of Engineers that result in restrictions of the use of wood from within 20 feet of the bank full stage and disallowing the use of incentives that are part of the FPA. Even as this paper is written, the ACOE is revising the RGP to make the process more difficult by requiring prior notification and other more stringent requirements related to NMFS's most recent biological opinion (SLOPES III).

Table 2. Non-regulatory Private Industrial Forests Summary of Road Improvements for Oregon Coastal Coho ESU (1997-2003)

	1997	1998	1999	2000	2001	2002	2003	Totals
Miles of Road Surveyed	1332.04	1750.77	2200.56	413.02	600.15	159.86	417.00	**6973.40**
Fish Passage Structures	78	132	115	95	90	54	34	**598**
50 year peak flow	217	395	522	397	455	573	124	**2683**
Filtering cross drains added	74	275	311	274	255	267	136	**1692**
Other cross drains added	550	644	725	884	753	680	391	**4627**
Culvert outlet protection	10	42	32	7	6	32	26	**155**
Miles of Durable surfacing	50.01	77.76	128.00	98.50	78.76	73.88	25.28	**532.20**
Miles of Ditch Rocking	0.03	0.17	0.00	0.00	0.48	0.04	0.08	**0.80**
Miles of Sidecast Pullback	10.21	13.30	7.38	2.54	1.29	12.38	11.30	**58.40**
Large Landslides Stabilized	8	7	5	4	2	3	6	**35**
Miles of Roads Vacated	5.31	11.84	40.38	16.03	23.36	12.76	3.10	**112.78**
Miles of Roads Closed	9.64	5.64	11.16	11.52	15.77	2.92	0.00	**56.65**
Miles of Roads Relocated	0.52	0.42	0.49	0.25	0.40	0.42	0.00	**2.49**
Miles of Legacy Road Reconstruction	37.94	5.40	0.00	0.00	0.00	0.00	0.00	**43.33**
Miles of Grass Seeding	37.43	0.00	41.46	24.45	13.15	27.08	8.01	**151.58**

Figure 1. Numbers of miles with various non-regulatory riparian restoration treatments from 1997 to 2003.

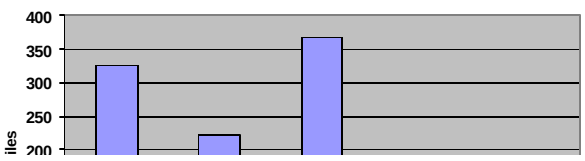

Table 3. Non-regulatory Instream Large Wood Placement Projects Done by Private Forest Landowners

	Private Industrial Landowners		Private Non-industrial Landowners		Projects with Multiple Landowner Types Private Industrial & Private Non-industrial		
Year	Large Wood Placement Projects	Anchored Log Structure Projects*	Large Wood Placement Projects**	Anchored Log Structure Projects*	Large Wood Placement Projects	Anchored Log Structure Projects*	Total
1997	54	8	8	5	0	0	**75**
1998	62	5	4	1	1	0	**73**
1999	32	0	2	0	1	0	**35**
2000	26	0	2	1	0	0	**29**
2001	17	0	0	1	0	0	**18**
2002	22	0	4	0	1	0	**27**
2003	14	0	4	0	0	0	**18**
Total	**227**	**13**	**24**	**8**	**3**	**0**	**275**

PFI = Private Industrial Forest Landowner
PLF = Private Non-Industrial Forest Landowner
*not overlapping with Large Wood Placement Projects
**one LWD project in 1997 and 2 in 2002 were PLFs combined with another LO type

3. The legal procedural requirements (e.g. environmental review) necessary to implement the plan are described, and information is provided indicating that fulfillment of these requirements does not preclude commitment to the effort.

Legal Procedural Requirements Necessary to Implement the Plan

Rule Review & Revision

ODF regulates forest operations on nearly 2,919,701 acres of privately owned forestland within the ESU. The program's stewardship foresters and department staff guide forest landowners and operators on how to conduct forest operations so they are in compliance with the Forest Practices Act statutes and administrative rules. FPA rules apply to harvesting, reforestation, road construction and repair, slash disposal (treetops, branches, brush and tree limbs left on the ground after a logging operation), chemical application use and stream, lake and wetland protection. Resource sites, such as bird nesting and roosting locations, and threatened and endangered species sites are also protected under the rules. The success of the Forest Practices Act reflects the vision of providing for economic, environmental and social values, created by the 1971 Legislature, as well as the efforts of landowners and stewardship foresters who collaborate on the ground to focus on results, rather than process.

Board of Forestry rulemaking is subject to strict statutory requirements to provide findings that specific standards are met and an economic impact analysis has been completed (ORS 527.714**)**. The Board cannot adopt rules setting new standards for forest practices without making a number of specific findings, including findings that existing standards are inadequate and scientific evidence supports new standards. Further, proposed new standards must be narrowly tailored to achieve their stated objective, must be the "least burdensome" regulatory alternative, and must achieve benefits proportional to the harm caused by the challenged forest practice.

The Department has maintained an active monitoring program that has provided information to the Board in making the findings. The monitoring program also synthesizes related external research and monitoring findings for the Department and Board. The Board has also been reviewing recent reports completed by the Forest Practices Advisory Committee, ODF/DEQ Sufficiency Analysis, and the IMST recommendations regarding the adequacy of current forest practices. The Board and Department welcome any quantitative research and/or monitoring findings from NMFS, or other parties, that are relevant to the review and adequacy of current forest practices.

The PCF Research and Monitoring Program conduct studies and surveys to monitor forest conditions in Oregon and to expand scientific knowledge. Areas of study have included topics such as monitoring fish presence, shade conditions above streams, compliance with best management practices, and compliance and effectiveness of forest practice rules. These studies and findings are used in ODF's extensive public advisory processes for implementing potential changes to the Forest Practices Act rules. Following is a list of technical reports which can be read at http://www.odf.state.or.us or copies can be obtained directed from the Department of Forestry.

- **FP Technical Report #1** - OFPA Water Protection Rules: Policy And Scientific Considerations
- **FP Technical Report #2** - Cooperative Stream Temperature Monitoring Project Completion Report For 1994 - 1995 (Small Type N Streams) *(Sept 1999)*

- **FP Technical Report #3** - Effectiveness of Riparian Management Areas and Hardwood Conversions In Maintaining Stream Temperature *(March 1997)*
- **FP Technical Report #4** - ODF Storm Impacts And Landslides of 1996 *(June 1999)*
- **FP Technical Report #5** - ODF Forest Practices Compliance Monitoring Project: 1998 Pilot Study Results *(Nov 1999)*
- **FP Technical Report #6** - ODF Compliance With Fish Passage And Peak Flow Requirements At Stream Crossings: Pilot Study Results *(March 2000)*
- **FP Technical Report #7** - ODF Aerial Pesticide Application Project Final Report *(March 2000)*
- **FP Technical Report #8** - Evaluation of the Effectiveness of Forest Road Best Management Practices to Minimize Stream Sediment Impacts
- **FP Technical Report #9** - Forest Roads, Drainage, and Sediment Delivery in the Kilchis River Watershed *(June 1997)*
- **FP Technical Report #10** - Forest Road Sediment and Drainage Monitoring Project Report for Private and State Lands in Western Oregon *(Feb 1998)*
- **FP Technical Report #12** - Harvest Effects on Riparian Function And Structure Under Current Oregon Forest Practice Rules *(July 2001)*
- **FP Technical Report #13** - Shade Conditions Over Forested Streams in the Blue Mountain and Coast Range Geo-regions of Oregon *(August 2001)*
- **FP Technical Report #14** - ODF Compliance With Fish Passage and Peak Flow Requirements at Stream Crossings: Final Study Results *(April 2002)*
- **FP Technical Report #15** - ODF Forest Practices Compliance Monitoring Project: Final Study Results *(April 2002)*
- **FP Technical Report #16** - Oregon Headwaters Research Cooperative: Workshop Summary *(Oct 2001)*
- **FP Technical Report #17** - Forest Road Use During Wet Weather *(June 2003)*

Current Monitoring Efforts

The Oregon Department of Forestry's, Forest Practices Monitoring Program is currently collecting data on three monitoring studies.

The first, "Riparian Function and Stream Temperature: Effectiveness of Oregon Department of Forestry's Protection Rules and Strategies" is in the third year of a total of seven years. This monitoring project is designed to answer the following questions.

1. Are the riparian rules and strategies effective in meeting DEQ water quality standards regarding anti-degradation of stream temperature and the water quality standard?
2. Are the riparian rules and strategies effective in maintaining large wood recruitment to streams, downed wood in riparian areas, and shade?
3. What are the trends in riparian area regeneration?
4. What are the trends in overstory and understory riparian characteristics and how do they along with channel and valley characteristics relate to stream temperature and shade?

Forest Practices Monitoring is also currently evaluating compliance with ORS 527.676 leave tree and downed log requirements. The "Leave Tree and Downed Wood" project is also designed to help ODF to:

1. Describe characteristics of leave trees and downed logs retained.
2. Provide information on the size, density, distribution, and characteristics of leave trees retained in harvest units
3. Provide information on the size, density, distribution, and characteristics of downed logs retained in harvest units.
4. For units with leave trees retained in RMAs, describe the characteristics of those streams (e.g., stream class) and proportion of leave trees retained in the RMA.

Another monitoring study that is ongoing is the "Long Term Stream Temperature Monitoring" project. This project is collecting stream temperature data to provide information on the trends and patterns in stream temperature over a longer period of time. Some of the sites included in this project have stream temperature data starting in 1994.

Sufficiency Analysis

The Oregon Department of Forestry and Department of Environmental Quality produced an October 2002 report regarding their findings and recommendations in a report: Sufficiency Analysis*:* A Statewide Evaluation of Forest Practices Act Effectiveness in Protecting Water Quality. The purpose of the sufficiency analysis was to determine:

(a) The adequacy of the FPA pursuant to ORS 527.765 in the achievement and maintenance of water quality standards, with due consideration to regional and local variation in effects;
(b) If forest practices contribute to identified water quality problems In listed water quality limited streams; and
(c) If so, to determine whether existing forest practice rules provide sufficient control to assure that water quality standards will be met so that waters can be removed from the 303(d) list.

The sufficiency analysis is based on the premise that achieving the goals and objectives of the FPA will ensure the achievement and maintenance of water quality goals. Conclusions include the finding that there is some risk current protections may not be sufficient at a site-specific scale for some small and medium streams, however the significance and scope of this risk is uncertain. The analysis and recommendations are offered to highlight general areas where current practices are either sufficient or could be improved in order to better meet the FPA goals and objectives and in turn provide added assurance of meeting water quality standards (Appendix C).

ODF's role as a Designated Management Agency*:*

The Oregon Department of Forestry is the designated management agency for regulation of water quality due to pollutants from forest operations. The Oregon Board of Forestry, in consultation and with the participation and support of the Environmental Quality Commission has adopted water protection rules for forest operations (ORS 527.765). Forest operators conducting operations in accordance with the Forest Practices Act (FPA) are considered to be in compliance with Oregon's water quality standards (ORS 527.770).

House Bill 3264, passed by the 2003 Legislative Assembly, removed the Board of Forestry and State Forester's authority to 'approve' written plans and the requirement to comply with a written plan. The legislation prohibited the BOF from adopting or enforcing any rule that requires the Board or State

Forester to approve written plans as a required precedent to conducting a forest practice or operation. This legislation does not alter ODF's commitments to participate in the Oregon Plan nor the standards that have been established under the FPA. Compliance with all resource protection standards, practices and outcomes continues to be required under Oregon law. Standards for operations set by the FPA and rules are 'achieved through a combination of education and review prior to the commencement of an operation and through enforcement actions where appropriate under state law, rather than through a system of prior approvals. The ODF and BOF are currently working with the private forestry community to revise the rules to:

- Address rules that make use of a prior approval process consistent with HB 3264; and to
- Evaluate current procedures for effective communication to prevent the need for enforcement actions
- Clarify and simplify rule organization and wording

Restoration Program

Procedures for Developing Non-regulatory Management Strategies
The Forest Practices Act provides a regulatory foundation for protecting watersheds, much of the habitat enhancement work is being accomplished by private forest landowners through non-regulatory actions. A non-regulatory pathway provides a way for landowners to choose to do more than what is required and/or to test assumptions that a particular action may or may not accelerate reaching a desired riparian condition. When ORS 527.714 findings cannot be established, yet an activity seems likely to have benefits, an Oregon Plan non-regulatory action may be developed in lieu of a rule until monitoring or research can be conducted to provide more definitive information to base our actions on. By choosing Oregon Plan non-regulatory measures, landowners are, in some cases, providing the opportunity to test our assumption(s) that the work will result in benefits for fish and water quality.

An ad hoc committee, representing private forest landowner interests, develops non-regulatory management strategies. The PCFP stewardship foresters, ODFW habitat biologists and private forest landowners collaborate to design, implement, report, and monitor the private forest landowner's non-regulatory measures. Once the management strategies have been developed, the Board of Forestry, Governor's office, and natural resource legislative committees endorse the management strategies and provide support and recognition for accomplishments.

4. Authorizations (e.g., permits, landowner permission) necessary to implement the effort are described, and certainty is provided that the implementing parties will obtain these authorizations.

Legal Authority
The Oregon Forest Practices Act, adopted in 1971, encourages economically efficient forest practices consistent with the protection of forest resources including timber, water, soil, and fish and wildlife habitat. A key purpose for which the law was enacted was to ensure that forest operations are conducted to meet state water quality standards adopted under the federal Clean Water Act and implemented by the Department of Environmental Quality. The Forest Practices Act promotes compliance through prevention and education, but it is also enforceable through both criminal and civil processes. Under either approach, operators are required to repair damage to the extent practicable. Monitoring of forest practices show high levels of compliance with the laws (Dent 2002).

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Authorizations

Oregon statute (ORS 527.670) requires an operator, landowner or timber owner to notify the State Forester of intended forest operations. This Notification of Operation is not a permit or application for approval. It is a means of providing specific information to the Department of Forestry about the landowner's intent to conduct a forest activity at least 15 days prior to starting. This period of time allows the ODF to assess site conditions and what best management practices are appropriate to protect resources

Written Plans are a communication and planning tool used by the Oregon Department of Forestry and forest landowners that provide an opportunity to discuss the landowner's objectives, identify resources that need protection, FPA standards that must be met, and to suggest best management practices. Written plans are required for operations:

- Within 100 feet of a stream used by fish or for domestic use;
- Within 100 feet of a lake greater than 8 acres, or within 300 feet of a wetland greater than 8 acres;
- Operations within 300 feet of a resource site inventoried for threatened and endangered species; sensitive bird nesting, roosting and watering sites.
- Stream crossing fills over 15 feet deep
- Harvesting blow-down, diseased or insect-infested snags or down wood, or fire-killed trees in riparian management areas

Written plans may also be required for:

- Road locations in RMAs.
- Harvesting where rapidly moving landslides might occur.
- Building roads where rapidly moving landslides might occur.
- Machine activity in some streams, lakes or wetlands.
- Operating near critical wildlife habitat.
- Removal of beaver dams.

Enforcement is carried out when a violation of the FPA has occurred. The purposes of enforcement actions are to:

- Help the landowner meet his objectives while complying with the FPA and rules.
- Provide education so that understanding about why a violation occurred is achieved and

- Educate the responsible party so that they understand why a violation has occurred, and procedures are identified to avoid future violations, and to repair any damage that occurred to the extent possible.
- Responsibility is accepted.

Technical assistance is provided to forest landowners and operators in the field by stewardship foresters who assist landowners to achieve their objectives, consistent with resource protection, in an environmentally and economically sound manner. The department partners with a number of organizations such as Associated Oregon Loggers (AOL) and OSU Extension Service, and other state agencies to provide educational assistance about the FPA and Oregon Plan.

Certainty That Implementing Parties Will Obtain Authorizations

Notices of operation are assigned a Notification Number, which is important for harvest tax purposes. Timber cannot be sold to a mill for processing without the notification number. Stewardship foresters review the notice of operation to prioritize inspections of operations by resource risk for impacts.

The Forest Activity Computerized Tracking System (FACTS) is an electronic database containing information on all notifications of operations submitted to ODF. This information includes names and addresses of the listed operator, landowner, and timber owner, declared size of each operation unit and types of activities, legal description for the location of each unit, and special conditions that may exist. Table 4 provides the numbers of notices of operation within the coho study area and of those the numbers of types of water bodies and/or threatened and endangered species involved.

The notice of operation serves to alert the stewardship forester to opportunities to communicate with the landowner or operator about ways to protect resources as well as identify Oregon Plan non-regulatory opportunities. A primary 'red flag' for targeting an operation for communication is the proximity to a fish bearing stream or other protected water body. The numbers of operations with threatened and endangered species could be, but is not necessarily an indication of the listing status of species, but may simply be that operations were not occurring at these locations with great frequency. Regardless of species listing decisions, when an operation is planned where water resources exist, compliance with the FPA becomes more critical and communication with the operator to assist them to comply with the rules is paramount.

Table 4 - Coastal Coho ESU FACTS Data

Year	Notices of Operation	Within 100 feet of any Lake or Stream	Within 300 feet of any Estuary or Wetland (> 8 acres)	Wetland > 8 acres	Wetland < 8 acres	Lake > ½ ac or has fish	All Other Lakes & Streams	Bog	Estuary	Stream	T & E Species
1997	10,095	5772	184	36	34	3	24	5	14	3301	25
1998	8,695	5974	157	92	61	4	53	5	16	4705	3
1999	10,070	7223	187	135	106	5	69	3	11	6765	10
2000	9,144	6944	136	152	85	4	57	3	9	6777	8
2001	8,567	6887	112	96	46	8	47	2	5	7018	9
2002	9,827	7120	125	112	33	14	62	0	1	6991	0
2003	8,578	6829	108	120	25	9	45	1	6	6320	4

The Service Forestry Activity and Accomplishment Report System (SFAAR) database provides information on the accomplishments and level of technical assistance provided by ODF stewardship foresters (Table 5). Technical assistance provided helps to ensure that operators are implementing appropriate BMPs. Assistance provided includes advice on road design and improvement, fish passage structures, riparian enhancement and streambank protection, fish habitat enhancement, and wetland restoration. Activities counted also include Conservation Reserve and Enhancement Projects (CREP) technical assistance for agricultural landowners.

The data reported to SFAAR under estimates the numbers of times that a stewardship forester assists landowners. Reporting to this database has not consistently been conducted in the past. Also, it is difficult, if not impossible, to equate numbers of personnel to numbers of actions reported, because rules change over time and roles and responsibilities as well. Therefore direct comparisons of the numbers of foresters in Table 1 above provide a snapshot in time, while the numbers of Service Foresters (now called stewardship foresters in the merged Private and Community Forests Program) has changed from five in the coast range from 1997 to 2003. The new program combines what used to be the Forestry Assistance and Forest Practices Programs. While one program was focused solely on assistance and the other on regulation, under the new program foresters perform both services. The ODF has begun a process to identify needs for reporting using a Geographic Information System which will improve efficiency and effectiveness in reporting information about our program.

Table 5 - SFAARS Data 1997 to 2003

County		# Projects Technical Assistance Provided	# of Acres Technical Assistance Provided	# Projects Completed	# Acres Completed
Clatsop		7	115	1	40
Columbia		34	1,335	11	84
Coos		50	878	1	7
Curry		9	185	2	66
Douglas		49	913	26	211
Lane		58	371	14	36
Lincoln		47	884	6	287
Tillamook		3	104	1	1
TOTALS		**257**	**4,785**	**62**	**732**

Compliance rates can be a function of landowner support of current rules and regulations. It is the policy of the Department of Forestry to gain compliance with the Forest Practices Act (FPA) through a program that maintains an effective balance of science and technology based rules, incentives, educational, and technical assistance efforts and uniform enforcement. Monitoring studies of forest practices show high levels of compliance with the FPA.

5. The type and level of non-regulatory participation necessary to implement is identified, and a high level of certainty is provided that the parties that will implement the effort will obtain that level of non-regulatory participation.

Type and Level of Non-regulatory Participation

The Oregon Department of Forestry and State and Private Forestry Community Oregon Plan Statewide Work Program identifies the type and level of non-regulatory participation necessary to implement their

commitment to the Oregon Plan. The type and level of participation on private forestlands is described in ODF 3: Non-regulatory Private Landowner/Operator Activities. FPA Attachment 4 provides a brief description of the non-regulatory management strategies, threats to the ESU that the strategies are intended to address, implementation schedule, and funding sources.

Level of Certainty

Private forest landowners have developed a set of non-regulatory actions as their commitment to the plan. Landowners are more likely to choose actions which they have developed themselves and that make sense to them. Although the non-regulatory components of the plan are implemented at the discretion of the landowner, the numbers of activities, reported to the OWEB Watershed Restoration Inventory, provide evidence of their commitment to proceed (Table 2, Figure 1, and Table 3). Not all actions should be implemented at every site and the landowner can choose those which are most likely to have a beneficial impact on coho. The ODFW habitat biologist and ODF stewardship foresters provide assistance to help landowners determine what measures to implement to meet the landowners' objectives. By understanding the economic, environmental and social situation of the landowner and the watershed context within which the actions are to be applied, we hope to achieve a high level of certainty that the actions will be implemented and applied appropriately.

6. Regulatory mechanisms (e.g., laws, regulations, ordinances) necessary to implement the conservation effort are in place.

FPA Laws & Regulations

The Oregon Forest Practices Act, adopted in 1971, regulates harvest practices and other forest operations to protect forest resources including timber, water, soil, and fish and wildlife habitat. A key purpose of the Act was to ensure that forest operations meet state water quality standards adopted by the State of Oregon under the federal Clean Water Act and implemented by the Department of Environmental Quality or Designated Management Authority. The Forest Practices Act promotes compliance through prevention and education, but it is also enforceable through both criminal and civil processes. Under either enforcement approach, operators are required to repair damage to the extent practicable.

The FPA sets standards for any commercial activity involving the establishment, management or harvesting of trees on Oregon's forestlands. It regulates these forest operations on all non-federal lands (private, state-owned, and county- or city-owned). Operations on lands managed by the USDA Forest Service and USDI Bureau of Land Management are not directly regulated but their management plans are assumed to meet or exceed the Oregon Forest Practices Act requirements.

The FPA rules cover a wide range of issues pertaining to forest operations and resource protection. In general, the Rules are designed to minimize impacts of forest activities on other forest resources. Among other things, the rules focus on minimizing sediment delivery to channels, providing 50-year flow and juvenile fish passage through culverts, maintaining function of riparian areas, and protecting water quality, air quality, wildlife and fish habitat. It is important to recognize that the Rules address minimizing impacts versus having no impact. This is a practical approach to both maintaining an economically viable forest industry and protecting other forest resources and functions.

The Water Protection Rules identify and distinguishes among streams, lakes, and wetlands seven geographic regions across the state. The rules further distinguish each stream by size and type.

Stream size is distinguished as small, medium, or large, based on average annual flow and beneficial use. This approach endeavors to recognize that forests are dynamic, with regional differences resulting from inherent characteristics and disturbance regimes. Stream type is distinguished as fish use, domestic use, or neither (Table 6).

Table 6. Riparian Management Area widths for streams of varying sizes and beneficial uses (OAR 629-635-310).

	Type F	Type D	Type N
LARGE	100 feet	70 feet	70 feet
MEDIUM	70 feet	50 feet	50 feet
SMALL	50 feet	20 feet	Apply specified water quality protection measures, and see OAR 629-640-200

The FPA rules are designed to address the resource issues identified in the FPA policy (sound management of forest, soil, air, water, fish and wildlife resources, and scenic resources). The rules are categorized into divisions (Table 7), each with its own description of purpose. The purpose statements further refine the broad objectives of the Rules and Act. All divisions are within Oregon Administrative Rules chapter 629.

Table 7. Oregon Department of Forestry Administrative Rules

Division	Division Description
600	Definitions
605	Planning Forest Operations
606	Stewardship Agreements
610	Reforestation Rules
611	Afforestation Incentive
615	Treatment of Slash Rules
620	Chemical and Other Petroleum Product Rules
625	Road Construction and Maintenance Rules
630	Harvesting Rules
635	Water Protection Rules: Purpose, Goals, Classification and Riparian Management Areas
640	Water Protection Rules: Wetlands and Riparian Management Areas
645	Water Protection Rules: Riparian Management Areas and Protection Measures for Sign. Wetlands
650	Water Protection Rules: Riparian Management Areas and Protection Measures for Lakes
655	Water Protection Rules: Protection Measures for Other Wetlands, Seeps, and Springs
660	Water Protection Rules: Specified Rules for Operations Near Waters of the State
665	Specified Resource Site Protection Rules
670–680	Civil Penalties, Appeals, Hearings Procedures, Stay of Operations, Access to Notifications and Written Plans, Regional Forest Practice Committees, and the Resource Site Inventory and Protection Process

The Forest Practice Rules cover a wide range of issues pertaining to forest operations and resource protection. In general, the Rules are designed to minimize impacts of forest activities on other forest

resources. Among other things, the rules focus on minimizing sediment delivery to channels, providing 50-year flow and juvenile fish passage through culverts, maintaining function of riparian areas, and protecting water quality, air quality, wildlife and fish habitat. It is important to recognize that the Rules address minimizing impacts versus having no impact. This is a practical approach to both maintaining an economically viable forest industry and protecting other forest resources.

The Forest Practices Act and Rules are considered a Best Management Practices (BMPs) program. BMPs are defined as practices that are practical and effective at reducing non-point source pollution to standards compatible with water quality goals. Once an agency's BMPs are approved by the state water quality regulatory agency, they are certified as the water quality management plan (WQMP) for landowners that implement them. A WQMP illustrates how a landowner will achieve acceptable water quality. When forest landowners properly implement BMPs, they are actually implementing a WQMP designed to maintain water quality. It is the responsibility of the ODF to monitor the effectiveness and implementation of BMPs in achieving that objective.

The Board of Forestry is currently deliberating whether changes to the FPA are necessary. Board rulemaking is subject to strict statutory requirements to provide findings that specific standards are met and an economic impact analysis has been completed (ORS 527.714**)**. The Board cannot adopt rules setting new standards for forest practices without making a number of specific findings, including findings that existing standards are inadequate and scientific evidence supports new standards. Further, proposed new standards must be narrowly tailored to achieve their stated objective, must be the "least burdensome" regulatory alternative, and must achieve benefits proportional to the harm caused by the challenged forest practice.

The Department has maintained an active monitoring program that has provided information to the Board in making the findings. The monitoring program also synthesizes related external research and monitoring findings for the Department and Board. The Board has also been reviewing recent reports completed by the Forest Practices Advisory Committee, ODF/DEQ Sufficiency Analysis, and the IMST recommendations regarding the adequacy of current forest practices. The 2003 water quality temperature standard will also be included in the Board's deliberations. The Board has asked EPA and others to bring forward quantitative research and monitoring information to inform the Board's review of the adequacy of the FPA and the ORS 527.714 findings. To date, this information has not been provided. The Board and Department welcome any quantitative research and/or monitoring findings from NMFS, or other parties, relevant to the review and adequacy of current forest practices.

7. A high level of certainty is provided that the implementing parties will obtain the necessary funding.

Funding is contingent on biennial appropriations by the state legislature for programs supported in the Governor's Recommended Budget and supported by affected stakeholders. The regulatory and non-regulatory activities frame the Oregon Plan as an established program with bipartisan support.

Funding for private industrial forestland projects is primarily provided by industrial landowners, while funding for non-industrial landowner projects is generated by several sources including landowner contribution and assistance from OWEB and other cost share or grant sources. In addition to grants from OWEB, a number of organizations provide funding assistance for non-industrial forest landowners.

8. An implementation schedule (including incremental completion dates) is provided.

Regulatory

Landslide and forest road rules were adopted in 2002. Rules to address riparian issues are being deliberated by the Board of Forestry. Draft riparian rules may be available for public comment in 2005 (Table 8). Shaded rows in the table indicate concepts that the Board is considering for rules, while un-shaded rows are actions more likely to follow a non-regulatory pathway or that require further research and monitoring.

Table 8

Region	Concept	Proposed Action	Decision/Schedule[2]
Statewide	1. Clarify Water Protection Rules policy statement	Rule—Revise OAR 629-635-0100; add OAR 629-605-0103 as a link to Oregon Plan Measures	Draft rule language approved July 2003
	2. Use Type F prescriptions for large and medium Type N streams	—New Oregon Plan Measure in lieu of revising OAR 629-640-0100, 0200, and Tables 1, 6, and 7	path approved March 2004
	3. Riparian management areas (RMA) above fish barriers	Rule—Revise OAR 629-635-0200	April 2004 [1]
	4. Wood from debris flows and landslides	Rule—Revise OAR 629-640-0200 (10)	Draft rule language approved Sept. 2003
	5. Channel migration zones	—Monitor, evaluate CMZs in lieu of revising OAR 629-600-0100, 629-635-0310, and 629-640-0200 (7)(a)	path approved Sept. 2003
	6. Stratification	Guidance (currently allowed through site-specific plans) in lieu of new rule OAR 629-640-0310	Not proceed – address through guidance and training approved March 2004
	7. Large wood placement	Revise OAR 629-640-0110	April 2004
Western Oregon	8. Basal area target increase for medium and small Type Fs	Rule—Revise OAR 629-640-0100 (6), including Tables 2 and 3	Draft rule language approved Oct. 2003
	9. 60% Basal area cap	—Oregon Plan Measure 3.7 in lieu of revising OAR 629-640-0100(6)	path approved October 2003
	10. No harvest within ½ RMA	—Revise Oregon Plan Measure 3.7 in lieu of revising OAR 629-640-0100 (2)	
	11. Retain largest trees within the RMA	—New Oregon Plan Measure in lieu of revising OAR 629-640-0100 (creating new section (6))	
	12. Small Type N streams	Rule—Revise OAR 629-640-0200 (5)	April 2004
Eastern Oregon	13. Desired future condition	Board Discussion on revising OAR 629-640-0000	Further Policy Discussion approved March 2004 [2]
	14. Basal area targets	No Change – Further Monitoring Required	Not proceed approved March 2004
	15. No harvest alternative	No Change – Further Monitoring Required	Not proceed approved March 2004
	16. Small Type N streams	Rule—Revise OAR 629-640-0200 (6)	April 2004

Statewide Initiatives	17. Fish habitat incentives	—New non-regulatory measure	April 2004
	18. Small Type N stream monitoring	Retain OAR 629-635-0110; Remove obsolete references	April 2004

Restoration

An implementation schedule for non-regulatory actions is provided in the Oregon Department of Forestry and State and Private Forestry Community Oregon Plan Statewide Work Program. FPA Table 9 provides a brief summary of the non-regulatory measures, the threats to the ESU that the measures are intended to address, implementation schedule, and funding source.

New non-regulatory measures may be developed during 2005 for some riparian concepts currently being deliberated by the Board. A work group, represented by private forest landowners, will be asked to develop measures consistent with the Board's deliberations.

Table 9 - Private Forest Landowner Oregon Plan Actions in the Coastal Coho ESU

Action	Description	Threats to ESU	Schedule	Funding	Monitoring	#s of Projects Non-regulatoryed
Road Project	• Road Hazard Inventory • Fish Passage • Road Drainage • Roads built prior to FPA brought up to current standards • Road closure, vacation, or relocation	Water Quality • Reduce sediment Physical Habitat • reduce excessive fine sediment • passage impediments	Complete by 2012.	Forest Industry funds own; some non-industrial Landowners need funding assistance.	ODF Technical Reports # 14 & 15.	See OWEB Report (Activity - ODF 1S).
Riparian Projects						
? Conifer Restoration	Establish conifers where conifers are preferred for long-term habitat needs	Water Quality • Temperature • turbidity Physical Habitat • riparian condition • future large wood	Site specific plan required & landowner discretion	Funded by landowner	ODF Technical Report #3	See OWEB Report (Activity - ODF 8S)
? Additional Conifer Retention on Fish Streams	Speed the rate the desired future condition is reached to provide large wood and other riparian functions – no more than 25% basal area exceeding the standard target is harvested.	Water Quality • Temperature • turbidity Physical Habitat • riparian condition • future large wood	Landowner discretion on site specific basis	Funded by landowner	Monitoring has not been conducted	See OWEB Report (Activity – ODF 19S)
? Increase RMA on Small Non-fish Streams	Establish 20-foot RMA to increase potential large wood delivery to fish bearing streams.	Water Quality • Temperature • turbidity Physical Habitat • future large wood	Landowner discretion on site specific basis	Funded by landowner	Monitoring has not been conducted	See OWEB Report (Activity – ODF 20S)
? Leave Tree Placement & Additional Non-regulatory Retention	Landowner opts to leave more than the required 25% of leave trees within the RMA.	Water Quality • Temperature • Turbidity Physical Habitat • future large wood	Landowner discretion on site specific basis	Funded by landowner	Monitoring has not been conducted	See OWEB Report (Activity – ODF 22S)

Action	Description	Threats to ESU	Schedule	Funding	Monitoring	#s of Projects Non-regulatoryed
? Non-regulatory No-Harvest RMA	Landowner elects to not harvest within the RMA even though the FPA allows harvesting to occur.	Water Quality • Temperature • Turbidity Physical Habitat • future large wood	Landowner discretion on site specific basis	Funded by landowner	Monitoring has not been conducted	See OWEB Report (Activity – ODF 62S)
Instream Projects						
? Actively Place Large Wood	Place large wood in stream during harvest operations to provide immediate habitat benefits in economically efficient manner.	Water Quality • Temperature (pools & instream substrate for water to flow through & cool) • Reduce sediment Physical Habitat • Channel morphology • Lack of spawning gravel • Instream roughness	Landowner discretion on site specific basis & where wood is needed	Funded by landowner	Monitoring has not been conducted	See OWEB Report (Activity – ODF 21S)
? Create alcoves & side channels	Modify stream channel to create side channel and alcoves for a number of habitat benefits. This option requires additional review through approval of an 'alternate plan.'—or will when the riparian rules are adopted.	Water Quality • Reduce turbidity Physical Habitat • Channel morphology-- reduce velocity during high flow events • Filter excessive fine sediment	Landowner discretion & where a need is indicated.	Funded by landowner	Monitoring has not been conducted	
? Grazing Management (note: more typically chosen in eastern Oregon; has limited application for western Oregon as well)	Use of fencing or off-channel water for cattle and/or grazing management plan for timing and frequency of grazing.	Water Quality • Temperature • Toxics • Turbidity Physical Habitat • Riparian condition • Channel morphology • Excessive fine sediment	Landowner discretion on site specific basis	Funded by landowner	Monitoring has not been conducted	An ODF # does not exist for this activity.

Notes on Funding: Staffing to assist landowners with non-regulatory projects is provided by ODF, ODFW, & OWEB. Funding for these positions is through agency budgets. Non-industrial forest landowners sometimes seek outside funding sources.

9. The conservation agreement or plan is approved by all parties.

A committee, representing private forest landowners, develops non-regulatory management strategies. The PCFP stewardship foresters, ODFW habitat biologists and others assist private forest landowners to design, implement, report, and monitor the private forest landowner's non-regulatory measures. Once the landowner community has developed their management strategies, the Board of Forestry, Governor's office, and natural resource legislative committees endorse the management strategies and provide encouragement and support as needed.

References

Dent, Liz and Joshua Robben. April 2002. Oregon Department of Forestry Best Management Practices Compliance Monitoring Project: Final Report. Oregon Department of Forestry Forest Practices Monitoring Program Technical Report 15.

Morgan, Jo, 2000. Oregon Department of Forestry and State and Private Forestry Community Oregon Plan Statewide Work Program.

Independent Multidisciplinary Science Team Technical Report 1999-1, Recovery of Wild Salmonids in Western Oregon Forests: Oregon Forest Practices Act Rules and the Measures in the Oregon Plan Salmon and Watersheds.

Report of the Forest Practices Advisory Committee on Salmon and Watersheds, Oregon Department of Forestry, 2000.

Oregon Forests Resources Institute. 2002.Oregon's Forest Protection Laws: An Illustrated Manual. 160 pp.

Oregon Department of Forestry and Department of Environmental Quality Sufficiency Analysis: A Statewide Evaluation of FPA Effectiveness in Protecting Water Quality, Oregon Department of Forestry and Department of Environmental Quality, October 2002.

Office of the Governor, Executive Order No. EO 99-01, January 8, 1999. The Oregon Plan for Salmon and Watersheds.

Robben, J. and L. Dent, 2003. Best Management Practices Compliance Monitoring Project: Final Report, Oregon Department of Forestry.

2003 Forestry Program for Oregon, Oregon Board of Forestry, 2003. 76 pp.

Appendix A - IMST Report: Recovery of Wild Salmonids in Western Oregon Forests & Riparian Rule Summary

IMST Recommendation	ODF Action Completed	ODF Action Pending
1. Explicitly incorporate the policy objectives of the Oregon Plan and Executive Order 99-01 into OFPA.	The 2003 Forestry Plan for Oregon makes explicit that "*The Board will support and contribute to continuing statewide efforts under the OPSW to protect and enhance Oregon's native fish populations and water quality, while sustaining a healthy economy.*"	July 2004 draft FPA riparian rules also make explicit the policy objectives of the Oregon Plan in several rules (OAR 629-635-0100 and 629-605-0103) to encourage continued non-regulatory participation in the OPSW. Note: Draft riparian rules are being deliberated by the Board of Forestry. The official public comment period has not been initiated by the Board, but should proceed in 2005. Rules which have been ***adopted*** have been finalized; rules which are described as ***approved draft rules*** continue to be deliberated.
2. ODF should develop a policy framework to encompass landscape (large watershed) level planning and operations on forests within the range of wild salmonids in Oregon.	The 2003 FPFO provides a policy framework that will foster landscape level planning and operations on forests statewide. Much new information useful for implementing effective economic and social forest policies has been jointly developed by the Department of Forestry, Oregon State University College of Forestry, the USDA Forest Service Pacific Northwest Research Station, and others. However, more information is needed about conditions and trends of Oregon's forests to better craft coordinated approaches and to understand the implications of changes in forest policy and management at the landscape level and across ownerships. Once this information is available, the Board and ODF will be better able to implement a more coordinated management approach that is needed to promote the desired balance of forest value production.	ODF believes we should work with OSU College of Forestry and others to create and implement a process to build the scientific foundation necessary to support policy and technical changes that improve consistency of forest practices and forest management with the concepts of dynamic forest ecosystems and "primary purpose". Tools are also needed to: (a) better analyze short- and long-term risks; and (b) better analyze, at different scales, how well the different forest ownerships integrate to provide necessary resource protection. The Coastal Coho ESU assessment, currently underway, is an example of how natural resource agencies are beginning to conduct landscape scale evaluations of the OPSW. Lessons learned from the study will help us to improve our ability to conduct these types of assessments at various scales, and to move toward seamless communication between implementing agencies and local conservation groups.
3. Treat non-fish-bearing streams the same as small, medium, and large fish-bearing streams when determining buffer-width protection.	The Board of Forestry approved a draft rule in March 2004 that Type F prescriptions for large and medium Type N streams will be addressed through a non-regulatory pathway. The Board concluded that there was insufficient monitoring or scientific evidence that documents that degradation of resources is likely if forest practices continue to be conducted under existing regulations.	The July 2004 draft rules propose that: ➢ ODF will continue to prioritize monitoring small Type N streams as budget and resources are available. ➢ The Oregon Headwaters Research Consortium, formed in 2001, continues to address headwater stream research questions. ➢ Hinkle Creek is the site of a new, state-of-the-art paired watershed study to investigate the effects of contemporary forest practices on water quality, fisheries and aquatic habitat. It is the first ever paired watershed study located completely on private forestland. ➢ Increased protection for small Type N streams is continuing to be deliberated by the Board of Forestry.

IMST Recommendation	ODF Action Completed	ODF Action Pending
4. Provide increased riparian protection for the 100-year floodplains and islands	The Board of Forestry approved a draft rule in September 2003 that additional protection for channel migration zones would be addressed through non-regulatory measures. The Board concluded that there was insufficient monitoring or scientific evidence that documents that degradation of resources is likely if forest practices continue to be conducted under existing regulations.	ODF will address development of an Oregon Plan measure through an advisory committee process in 2005. Monitoring necessary to determine whether existing riparian rules are effective in protecting channel migration zones will be included in the department's monitoring strategy. Landowners choosing this non-regulatory option provide the opportunity for us to test our assumptions.
5. Increase the conifer basal-area requirement and the number-of-trees requirement for RMAs, with increases in these requirements for medium and small streams regardless of fish presence.	The Board of Forestry approved a draft rule in July 2004 draft rule language for an increase in basal area retention on medium and small Type F streams in western Oregon subject to the outcome of the analysis required by ORS 527.714. The Board rejected in March 2004 any basal area retention increase to medium and small Type F streams in eastern Oregon until there is sufficient monitoring or scientific evidence that documents that degradation of resources is likely if forest practices continue to be conducted under existing regulations.	**Related Rule Proposals** Draft riparian rules propose an increase in basal area for small and medium fish bearing streams in western Oregon. A physical habitat approach for classifying streams will be used for fish presence, including where field surveys show no fish use above artificial fish passage barriers. ***Monitoring & Research Necessary*** Insufficient information exists to expand the basal area increase to all other streams regardless of fish presence. Monitoring of small non-fish bearing streams is proposed to be a monitoring priority. ***Interim Non-regulatory Pathway*** Until better information can inform our rule making process, a number of non-regulatory Oregon Plan measures may be developed including measures to: ➢ Use Type F prescriptions for large and medium Type N streams. ➢ 60% Basal Area Cap. ➢ No harvest within ½ RMA ➢ Retain largest trees within RMA
6. Complete the study of the effectiveness of the OFPA Rules in providing large wood for the short and long term.	The study was completed and a report entitled "Harvest Effects on Riparian Function and Structure Under Current Oregon Forest Practice Rules" (Dent 2001) was released in July 2001. Based on data from this study, the Board of Forestry approved in July 2004 draft rule language for an increase in basal area retention on medium and small Type F streams in western Oregon subject to the outcome of the analysis required by ORS 527.714. The Board rejected in March 2004 any basal area retention increase to medium and small Type F streams in eastern Oregon until there is sufficient monitoring or scientific evidence that documents that degradation of resources is likely if forest practices continue to be conducted under existing regulations.	A rule is proposed to improve incentives for the active placement of large wood during harvest operations. The change will allow operators to harvest more trees from the riparian management areas in exchange for placing large wood in streams or doing other acceptable fish habitat improvement work. The increased incentive ratio is offset by an increase in the active management target for small and medium Type F streams in western Oregon.

IMST Recommendation	ODF Action Completed	ODF Action Pending
7. Provide enhanced levels of certainty of protection for "core areas".		The FPA provides for the use of site specific plans and alternate practices, and encourages management such that the desired outcomes are provided. Proposed riparian rules, the 2003 FPFO, and the Private and Community Forest Program strategic plan encourage active management within the RMA to provide for enhanced riparian function. Providing flexibility for alternate practices fits nicely with the concept of ***"core areas"*** as originally intended in the OPSW. That is, when landowners are informed about the habitat and life stage needs of species dependent upon "biological hotspots" either located on the landowner's property or downstream, management decisions can be made to maximize a return on their investments to enhance or restore habitat. We recognize that the landscape from the headwaters to the estuary is comprised of multiple ownerships, and all have a part to play in conducting management to conserve and restore watershed functions that are suitable to salmonids life cycle needs An example of how the FPA is evolving to recognize the importance of knowledge to inform landowners' management decisions is the proposed rule to strategically leave trees in debris prone locations where large wood can be delivered to downstream fish bearing reaches. Assisted by the ODFW field biologist and ODF stewardship forester, the landowner can determine whether this management strategy is the best to provide for a particular species or life stage.
8. Develop and implement standards or guidelines that reduce the length of roadside drainage ditches that discharge into channels.	The Board of Forestry adopted rules, effective January 1, 2003. Guidance has been developed. **629-625-0330 Drainage**: The purpose of this rule is to provide a drainage system on new and reconstructed roads that minimizes alteration of stream channels and the risk of sediment delivery to waters of the state. The rule provides a list of priorities to assist operators in achieving the intended purpose.	
9. Implement the standards and guidelines for the length of roadside drainage ditch between cross-drainage structures, especially on steep-gradient roads.	The Board of Forestry adopted rules, effective January 1, 2003. Guidance has been developed. **Drainage** (1) The purpose of this rule is to provide a drainage system on new and reconstructed roads that minimizes alteration of stream channels and the risk of sediment delivery to waters of the state. Drainage structures should be located based on the priority listed below. When there is a conflict between the requirements of sections (2) through (6) of this rule, the lowest	

IMST Recommendation	ODF Action Completed	ODF Action Pending
	numbered section takes precedence, and the later-numbered and conflicting section shall not be implemented. (2) Operators shall not concentrate road drainage water into headwalls, slide areas, high landslide hazard locations, or steep erodible fillslopes. (3) Operators shall not divert water from stream channels into roadside ditches. (4) Operators shall install dips, water bars, or cross drainage culverts above and away from stream crossings so that road drainage water may be filtered before entering waters of the state. (5) Operators shall provide drainage when roads cross or expose springs, seeps, or wet areas. (6) Operators shall provide a drainage system using grade reversals, surface sloping, ditches, culverts and/or waterbars as necessary to minimize development of gully erosion of the road prism or slopes below the road.	
10. Require the flow capacity of cross-drainage structures and stream crossing structures and culverts to meet current design standards.	The Board of Forestry adopted rules effective January 1, 2003. Guidance has been developed. Technology transfer, often through Associated Oregon Logger workshops, ODF monitoring, and other media have communicated what we have learned. **629-625-0320** ***Stream Crossing Structures*** (2) Operators shall design and construct stream crossings (culverts, bridges, and fords) to: (a) Pass a peak flow that at least corresponds to the 50-year return interval. When determining the size of culvert needed to pass a peak flow corresponding to the 50-year return interval, operators shall select a size that is adequate to preclude ponding of water higher than the top of the culvert; and (b) Allow migration of adult and juvenile fish upstream and downstream during conditions when fish movement in that stream normally occurs.	Roads built before the FPA are addressed through a non-regulatory Oregon Plan pathway. Discussion about the topic is provided in the next section.
11. Provide for the stabilization of roads not constructed to current standards (including "old roads and railroad grades") in critical locations.	**Critical Locations Policy - For Roads Subject To The FPA** 629-625-0100 and 0200, before roads are constructed or reconstructed, the Department will work with operators and landowners to locate these roads away from critical locations to the extent possible. Critical locations include high landslide hazard locations, slopes over 60 percent	**Incentives before Mandates** The BOF cannot mandate that roads built before the FPA be brought up to current standards. Furthermore, the 2003 Forestry Plan for Oregon supports cooperation and incentives as the preferred tools for promoting desired public benefits on private lands. Oregon Forest Industries Council members are recognized for their non-regulatory actions to address

IMST Recommendation	ODF Action Completed	ODF Action Pending
	with decomposed granite-type soils, within RMAs or within 50 feet of stream channels or lakes, or within wetlands.	work needed on roads built prior to the FPA. OWEB biennial reports document their contribution. We believe that a non-regulatory pathway to bring 'legacy' roads up to current standards has been a sound policy choice. **More work needed** The Coastal Coho Assessment Habitat Team is evaluating success of an Oregon Plan non-regulatory pathway to make legacy road improvements. We know that industrial forest landowners have completed many projects. We have monitored these projects for conformance with current standards and have shared information on what works best. Still, we cannot say how much work remains to be completed. Better ways of gathering and sharing information is needed to help us understand how far we have come and how far we have left to go. Numbers of reported projects have decreased recently. We would like to know whether the decrease is due to work having been completed, or whether other issues are involved. If work is nearing completion, how can we document that? If the latter, how can agencies better serve the process to provide meaningful incentives? Improvements are needed to better serve non-industrial landowners, who through conversation, have told us that they would like to improve legacy roads but need financial assistance and/or assistance in reporting what they have already accomplished.
12. Require durable surfacing on wet-season haul roads and require that hauling cease before surfaces become soft or "pump" sediment to the surface.	The Department completed a Wet Weather Hauling study in June 2003. Based on this data, the Board of Forestry adopted rules effective January 1, 2003. Guidance has been developed and training implemented. **629-625-0700: Wet Weather Road Use** (1) The purpose of this rule is to reduce delivery of fine sediment to streams caused by the use of forest roads during wet periods that may adversely affect downstream water quality in Type F or Type D streams. (2) Operators shall use durable surfacing or other effective measures that resist deep rutting or development of a layer of mud on top of the road surface on road segments that drain directly to streams on active roads that will be used for log hauling during wet periods. (3) Operators shall cease active road use where the surface is deeply rutted or covered by a layer of mud and where runoff from that road segment is causing a visible increase in the turbidity of Type F or Type D streams as measured above and below the effects of the road.	
13. Retain trees on "high risk slopes" and in likely debris torrent tracks to	The Board of Forestry approved draft rule language in July 2004 subject to outcome of the analysis required by ORS 527.714.	**Wood from Debris Flows Proposed Rule:** Provides a menu of methods to leave trees or downed wood where the materials can be moved by debris flows into

IMST Recommendation	ODF Action Completed	ODF Action Pending
increase the likelihood that large wood will be transported to streams when landslides and debris torrents occur.		fish-use streams. The proposed rule language recognizes the importance of upland sources of wood and provides a means for wood delivery not identified in current rules. Requiring operators to retain harvest unit leave trees (already required in harvest Type 2 or Type 3 units) along the lower portions of small Type N streams the Department determines are likely to experience torrents that would move wood into the adjacent Type F stream. The objective is to provide at least a portion of the upland source of large wood for fish streams. The revision would not require retention of any more trees than the current regulations do, but would require operators to leave a portion of those trees in a specific location.
14. Continue to apply the current best management practices (BMP) approach to the management of forest lands with significant landslide potential, and develop a better case history basis for evaluating the effectiveness of BMPs in these areas.	The Board of Forestry adopted rules effective January 1, 2003. Guidance has been developed. Technology transfer has been conducted to train stewardship foresters to implement the rule.	
15. Modify culverts and other structures to permit the passage of juvenile and adult salmonids upstream and downstream at forest road stream crossings.	The Board of Forestry adopted rules effective January 1, 2003. Guidance has been developed. Technology transfer through Associated Oregon Loggers has also occurred and other media, such as the FP monitor, developed to inform operators as we manage adaptively.	
16. ODFW and ODF should develop a collaborative program of monitoring to quantify the linkages between parameters of ecosystem condition and wild salmonid recovery.	ODFW has developed and implemented a collaborative monitoring program as a member of the Oregon Plan Monitoring Team and have collected some of the parameters that describe ecosystem conditions as part of that effort. Through initiatives like the Coastal Coho Assessment we anticipate the state natural resource agencies will be in a better position to define additional information needs to address this critical question.	***Coastal Coho ESU Assessment*** This study, currently underway, is an unprecedented first attempt to conduct landscape scale evaluations of the OPSW. Lessons learned from conducting the assessment will help us to improve our ability to conduct these types of assessments at various scales, and to move toward seamless communication between implementing agencies and local conservation groups. **Riparian Function and Stream Temperature Study (RipStream)** The objective of this study is to provide a coordinated monitoring effort with which to evaluate effectiveness of forest practices rules and strategies in protecting stream temperature, and promoting riparian structure that provides necessary functions for the protection of fish and wildlife habitat. The project will evaluate both privately and state-owned forestland. ODF is completing the 2nd year of baseline (i.e. pre-harvest) data for some sites and the first year of post-harvest data for other sites. Some sites have the two-years of pre-harvest data and are pending harvest. Analysis of the pre-harvest data is scheduled to begin in late 2004.

IMST Recommendation	ODF Action Completed	ODF Action Pending
		The Oregon Headwaters Research Cooperative (OHRC) has formed in Oregon to help address these headwater research needs. The purpose of the cooperative is to investigate local and downstream effects of forest management on the biota and habitat characteristics of headwaters stream systems. The goals of the OHRC are: 1. To gain scientific understanding of the physical and biological processes of headwaters stream systems. 2. To examine the local and downstream responses of headwater streams to a range of forest management prescriptions. Hinkle Creek is the site of a new, state-of-the-art paired watershed study to investigate the effects of contemporary forest practices on water quality, fisheries and aquatic habitat. It is the first ever paired watershed study located completely on private forestland.
17. ODFW should complete "core area" designation for all wild salmonids in Oregon and identify high priority protection/restoration areas that are not covered by current "core area" designations.	ODFW has developed a refined core areas and high priority areas for habitat restoration/protection in coastal watersheds. Analyses completed under the Coastal Coho Assessment will provide additional direction to this task.	
18. ODFW should include consideration of practices (forestry, agriculture, urban, other land uses) above and below core areas, as these may affect the conditions and processes critical to maintenance of core area function in forestry areas.	This task is related to #17. Our recent efforts to identify priority areas have focused on 6th field watersheds as the basis for establishing these areas, rather than stream segments (as was done for Core Areas).	
19. The Oregon Forest Research Laboratory (FRL), in collaboration with ODFW, should develop forest road-stream crossing strategies that facilitate the passage of large wood at road-stream crossings.	ODFW has not completed or initiated any action on this recommendation.	ODF is supportive of developing strategies to facilitate passage of large wood at road stream crossings.

Appendix B – FPAC Recommendations - Executive Summary
Forest Practices Advisory Committee on Salmon and Watersheds
Consensus and Strong Agreement Recommendations – August 2000

The following is a summary of the recommendations that have received either "consensus" or "strong agreement" among committee members. "Consensus" support means all committee members, present or represented by proxy at the meeting where the recommendation was discussed, expressed support. "Strong Agreement" means no more than three of the thirteen committee members expressed nonsupport. "Majority " support referenced in the body of the report means at least seven committee expressed support, but four to six committee members expressed nonsupport.

Fish Passage

Recommendation A: The forest practice rules should be revised to ensure that if an upstream reach has the natural capacity to be a fish bearing stream, but is currently a nonfish bearing stream because of a stream crossing structure that cannot pass fish, the reach will be classified as a fish bearing stream. The extent of potential fish use upstream of the blockage will be determined using guidance to be developed based on field fish presence surveys and interim criteria. *(See Option #1 under Fish Passage for more information.)*

Recommendation B: Forest landowners should accelerate the identification, prioritization, and restoration of existing stream crossing structures (typically culverts) that currently do not pass fish on streams inhabited at any time of the year by anadromous or game fish species, or fish that are listed as threatened or endangered species under the federal or state endangered species acts.

A new source of funding is necessary to encourage stream crossing repair work. The new funds could be generated based on forestland ownership, on timber harvested, on acres harvested, on road miles, or through some other mechanism (a preference for a per acre assessment based on forestland ownership was expressed by the committee). Landowners could then apply for a credit against expenses incurred in voluntarily remediating legacy road and culvert problems. *(See Option #2 under Fish Passage for more information)* The funding mechanism would be phased out as landowners completed repair work.

Recommendation C: The forest practice rules should be revised to incorporate a physical habitat approach to designating fish use and nonfish use streams. The Oregon Department of Forestry (ODF) has developed interim classification guidelines to designate fish use based upon the physical characteristics of a stream. These guidelines were based upon fish presence survey data and could be used to classify streams that are "fish use." The guidelines use either mapped or on-the-ground physical characteristics. The current stream classification rules would be amended to establish that fish use streams are any streams that meet the habitat criteria. The habitat criteria may need to be modified and improved based upon more recent and complete survey data. Key issues that will need to be addressed include the acceptable margin of error in applying a habitat model and opportunities for landowners to request field verification of habitat criteria. Fish presence survey data, when available, will supercede the guidelines in designating fish or nonfish use. *(See Option #3 under Fish Passage for more information.)*

Recommendation D: A funding source should be created for family forest landowners or the state should otherwise assist family forest landowners in obtaining funds from existing sources to expand the current non-regulatory road assessment effort to family forestland owners. This financial assistance would also be

used to help family forest landowners replace stream crossings that are not adequately passing fish. *(See Option #4 under Fish Passage for more information.)*

Forest Roads

Recommendation E: To address existing roads constructed using past practices or methods, such roads should be systematically evaluated and mitigated where appropriate for negative impacts or risks to:

1. Waters of the state;
2. Passage of juvenile/adult anadromous fish; and
3. Downstream passage of habitat elements.

"Other land-use" roads should use at least the same best management practices (BMPs) as required for forestlands.

The department should create specific road maintenance guidelines for high hazard locations by developing and making improved guidance available to operators and regulators. The department should be given general authority to require additional cross drainage installation as a maintenance requirement prior to an operation when current road condition and a proposed use will impair water quality. *(See Option #6 under Forest Roads for more information.)*

Recommendation F: Cross drainage structures on new roads should be installed so that the risk of sediment delivery to waters of the state from new roads is minimized.

While this is the current standard, the department should provide better guidance and training for achievement of the rules. Current rules provide authority for installation and maintenance of road cross drains. Training and improved guidance that would emphasize the need for adequate spacing and the proper installation of road cross drains would be developed and implemented for operators/landowners and regulators.

The forest practice rules should be revised to better clarify the objectives for cross drainage. For example, the rules might state that the objectives are to ensure that cross drains are installed in adequate numbers and in proper locations so that:

1. Road surfaces are protected from erosion and water retention;
2. Erosion of the roadside ditch is minimized;
3. Ditch water is not discharged onto unstable slopes; and
4. The amount of ditch water (and associated sediment) discharging directly into a stream is minimized. *(See Option #7 under Forest Roads for more information.)*

Recommendation G: The forest practice rules should be modified to more specifically address wet-weather hauling. This should include development of two criteria, probably in rule form, to:

1. Address road use in wet weather to ensure that durable surfacing or other effective methods are used on road segments that can deliver sediment to streams; and
2. Require operators to cease heavy truck traffic on roads when the road surface is breaking down (only for segments that are delivering sediment to streams). "Breaking down" would be defined by both

depth of ruts and by depth of muddy, fine sediment on the road. *(See Option #8 under Forest Roads for more information.)*

Recommendation H: The department should develop clear decision-making criteria for evaluating proposed road locations in areas where there is a high risk of landslides, surface erosion, or of direct physical alteration to streams, riparian areas, lakes or wetlands. The criteria should identify preferred locations and construction practices that will result in roads being constructed in a manner that results in the lowest overall impact to water quality and fish habitat while allowing the landowners to achieve their management objectives (Method 5). The criteria should also direct the Department of Forestry to not approve road construction or reconstruction in the sensitive areas described above, if viable alternatives exist. *(See Option #10 under Forest Roads for more information.)*

Recommendation I: Means should be developed or provided for the movement of large wood and sediment downstream at those crossings which may otherwise restrict movement. The transport mechanisms for large wood and sediments may be either stream storm flows or channelized debris flows. *(See Forest Roads Option #12 for more information.)*

Recommendation J: Improved cooperative road system planning, maintenance and use is needed between federal and private forest landowners. *(See Option #16 under Forest Roads for more information.)*

Recommendation K: Future forest road best management practice compliance and effectiveness monitoring should be implemented within the context of the Forest Practices Program's strategic monitoring plan and prioritized in context with available monitoring resources and other monitoring needs. *(See Option #18 under Forest Roads for more information.)*

Recommendation L: Additional training on forest road construction and maintenance should be provided for landowners and operators. *(See Option #19 under Forest Roads for more information.)*

Recommendation M: The forest practice rules should be changed to require prior approval for ground-based harvesting on steep slopes where there is a significant risk of sediment delivery to streams. *(See Option #57 under Forest Roads for more information.)*

Recommendation N: A road closure program should be developed that forest landowners, the Department of Forestry, and local law enforcement can use to limit public access onto sensitive road systems that have a high risk of delivering sediment to streams, or that directly impact aquatic habitat. (*See Option #59 under Forest Roads for more information*.)

Landslides

Recommendation O: All landslide-prone locations (now called "high-risk sites") should be identified prior to timber harvest operations. During the notification process, the department should inform the operator of the likely presence of high-risk sites in the operation area, based on coarse screen maps. The operator would then be expected to more specifically locate sites within the operation area by field reconnaissance. There is also the expectation that "significant" areas of high-risk sites which are not mapped will also be identified by the operator. *(See Option #45 under Landslides for more information.)*

Recommendation P: The department should identify stream channels which are prone to debris flows and torrents. Identifying those channels which are capable of transporting large wood to Type F streams could make it possible to focus riparian prescriptions on those streams where greater (fish bearing) benefit to aquatic habitats are likely.

The department should inform the operator during the notification process of the likely presence of debris flow-prone channels, based on coarse screen maps. The operator would then be expected to more specifically locate debris flow-prone channels by field reconnaissance. ODF would provide specific criteria to be used in field identification. *(See Option #46 under Landslides for more information.)*

Recommendation Q: The locations most prone to landslides (now called "high-risk sites") should be managed with techniques that minimize impacts to soil and water resources.

To achieve this objective, the best management practices used to protect high-risk sites that are currently in guidance should be incorporated into the forest practice rules (Method 1) and a better case history basis for evaluating the effectiveness of those practices should be developed (Method 6). These standard practices are designed to minimize ground alteration/disturbance on high-risk sites from logging practices. *(See Option #47 under Landslides for more information.)*

Recommendation R: It is important to leave trees or downed wood in locations where they provide wood to be moved by debris flows into fish bearing streams.

To achieve this objective, it is realistic or appropriate to use a menu of potential methods to leave trees or downed wood, depending upon likelihood of wood delivery and operational efficiency. It is not appropriate to rely on a single strategy to provide this potential source of large wood. The operator should be required to select an appropriate option in cooperation with ODF. *(See Option #61 under Landslides for more information.)*

Riparian Functions

Recommendation S: The active placement of large wood or other structures in streams deficient in wood or other structures is necessary for short-term aquatic habitat improvement, but it should be done in a manner that still assures the timely achievement and maintenance of characteristics of mature forest conditions in the riparian management area in the longer term. A menu of methods should be developed to prioritize and guide placement of large wood. This menu should include as one method placing wood along streams during an adjacent entry for harvesting. *(See Option #20 under Riparian Functions for more information.)*

Recommendation T: Additional department resources should be allocated to monitoring the effectiveness of the water protection rules. At a minimum, current levels of monitoring must be maintained. Adequate resources should also be provided to enable the department to conduct effectiveness monitoring related to the large wood objectives of the Oregon Plan for Salmon and Watersheds and water quality standards, as well as continued best management practices compliance monitoring. Coordination with other agencies on monitoring projects is essential. *(See Option #30 under Riparian Functions for more information.)*

Recommendation U: The State of Oregon should develop a clearer and more comprehensive policy on riparian management that addresses all land uses. The committee did not discuss whether such a policy

should require uniform protection on all land uses. However, the policy should, at a minimum, establish a baseline standard for resource protection and both clarify and explicitly describe Oregon's expectations for different land uses if some land uses will be required to meet a higher protection standard than others. *(See Option #41 under Riparian Functions for more information.)*

Recommendation V: The following list of changes are recommended to increase the protection and restoration of riparian functions. Further clarification and/or guidance on a number of these points will be needed to further develop these concepts.

1. Harvesting Cap 40%
   In western Oregon, manage any harvesting within the Riparian Management Area (RMA) so that the retained conifer basal area exceeds the basal area standard target, or 60 percent of the pre-harvest basal area, whichever is greater.

2. No Touch Area ½ of RMA
   The no-touch width will be equal to one-half the width of the entire RMA.

3. Largest Trees 10 Out of 20 Largest
   Retain 10 of the 20 largest trees per 1,000 feet outside of the no-touch width that will best achieve aquatic riparian functions. Subject to FPF approval, the landowner would identify tree locations in a written plan demonstrating how this objective will be met. There would be discretion to also consider operational issues and the value of the trees, as long as best achieving aquatic riparian functions remains the primary objective.

4. Type N Streams (Nonfish Bearing) Forest Practice Forester Discretion
   a. Small Type NT streams are: 1) Perennial Small Type N (temperature) streams that are tributary and contribute at least 30% of the flow to small and medium Type F streams and that have a drainage area larger than "X" acres (basin size to be set by georegion, 40 acres for the coast range). Initial classification will be based on basin size, but landowners may delist streams or stream segments verified as nonperennial. 2) Small Type N (torrent) streams with drainage basins greater than 30 acres, in which more than 75% of the basin has been mapped as "high" or 50% "extreme" debris flow hazard (by the State Forester) and which have a high probability of wood delivery to Type F streams.
   b. Small NT stream protection: 1) Up to the first 500 feet of Type NT (temperature) stream above the confluence with a Type F stream will have a 50-foot search zone, each side. Within the search zone, retain 4 square feet of trees per each 100 feet of perennial flow (up to 500 feet) and all nonmerchantable conifer on each side of the stream. Trees left along these streams to satisfy the basal area requirement can be counted as in-unit leave trees. 2) "Torrent" type NT streams will be protected as follows - FPF, working with the landowner, has discretion to direct retention of in-unit trees to 50' x 500' search zone (each side).

5. In-growth: 25% Adjustment for Small Streams
   The standard target will be recalculated for small Type F streams using the same per-acre basal area as large streams, minus 25 percent for in-growth. The standard target will also be recalculated for medium Type F streams, using the same per-acre basal area as large streams.

6. Riparian Specialist
The Oregon Department of Forestry will designate a riparian specialist in each administrative area who will be available to inventory and prepare riparian prescriptions for landowners, at their request. These specialists will be new positions funded by funds other than the harvest tax.

7. Similar Prescriptions for All Large and Medium Streams
Large and medium Type N stream prescriptions will be the same as the equivalent size Type F.

8. Monitoring
The effectiveness of the small Type N stream prescription will be a *-monitoring priority.

9. Alternative Vegetation Retention Prescriptions
The existing alternative vegetation retention prescriptions (e.g., hardwood conversions) may be applied to all riparian management areas (RMAs).

10. Preventing Sediment Delivery
The purpose statement for harvesting rules will be modified to better describe the objective of preventing sediment delivery to channels. The current requirement not to locate skid trails within 35 feet of Type F or D streams will be extended to all streams. Skid trails will be defined as an excavated trail used to yard logs with more than one turn.

11. Measurement of Riparian Management Area/Channel Migration Zone
The riparian management area (RMA) will be measured from the current points of measurement except for areas designated by the State Forester as a channel migration zone (CMZ). A CMZ is an unconstrained reach of stream that, in the judgment of the forester, is likely to have channel movement that can go outside the RMA widths within the period of a rotation (50-100 years). Within the CMZ, the no-touch area will be measured from the high-water mark of the channel (same as current rules). The outer edge of the CMZ will be based upon guidance to be developed by a technical committee. Retained trees in the CMZ shall be no less than the basal area standard target.

12. Type N and Small Type F Streams
Landowners would get credit for in-unit leave trees.

13. Conceptual Agreement About the Use of "Stratification"
In recognizing that riparian stands are not homogenous and that applying a single target for the RMA can prevent appropriate management in patches with conifer "over" stocking, agreement was reached on the concept of stratification. The details of how to do it in the field are to be developed. Stratification could allow an RMA to be divided into segments with a different management approach applied to each segment based on the specific conditions in the segment.

14. "Provide for Placement of Large Wood" is Supported as a Concept
(See "Subcommittee" Riparian Option under Riparian Functions for more information.)

Landscapes

Recommendation W: The Board of Forestry should ask the Governor to:

- Convene a collaborative process for landscape-scale approaches to protect and recover salmonids and provide and protect clean water across land uses and ownerships:

    1. Identifying and evaluating current policy frameworks and scientific findings related to landscape management;
    2. Developing common protocols for watershed assessment and monitoring;
    3. Review existing and proposed watershed assessment protocols and recommend a means to achieve an effective assessment;
    4. Identifying research needs, regulatory and nonregulatory policies, and technical methods to support landscape-scale approaches; and
    5. Improving cooperative approaches and partnerships among local, state and federal governments, and private landowners.

- Strengthen "Oregon Plan for Salmon and Watersheds" support for basin and watershed-scale assessment, collaboration, and restoration by:

    1. Linking funding support for Oregon Watershed Enhancement Board (OWEB) projects to basin and watershed priorities and those projects that are supportive of the goals of the Oregon Plan;
    2. Increasing long-term financial support for watershed councils and coordinators;
    3. Boosting funding to state agencies to enhance technical support to watershed councils and restoration activities of watersheds;
    4. Setting priorities, where possible, according to the identification of limiting factors on fish runs;
    5. Assembling a local/state/federal team to solve watershed and landscape-level problems that involve multiple governmental agencies. The team would recommend positive changes to reduce/eliminate duplication, do away with actions that are counter to the Oregon Plan, and improve communications. Where appropriate, nongovernmental representatives should be included; and
    6. Ensuring the long-term viability of the Oregon Plan by implementing Executive Order EO99-01.

- Support increased funding for scientific research and the establishment of a natural resource research institute to address landscape/watershed scientific questions and Oregon Plan policy issues using a multidisciplinary approach; and

- Strengthen policies to encourage maintenance of the forestland base and increase it through afforestation of suitable lands, since forests provide the best and most essential habitat components for salmonids.

Recommendation X: The Board of Forestry should:

- Include the policy objectives of the Oregon Plan for Salmon and Watersheds as part of its next revision of the Board's strategic plan, *The Forestry Program for Oregon*;

- Investigate, develop, and promote incentives--such as expanding the federal Conservation Reserve Enhancement Program (CREP), providing financial assistance, using forest stewardship plans, and easing anti-trust restrictions to encourage forest landowners to encompass broader landscape goals in their management plans; and

- Continue to investigate and analyze forest conditions across the landscape through:

    1. The Department of Forestry's Forest Assessment Project which has forged partnerships with Oregon State University and the Pacific Northwest Research Station; and
    2. Data and models developed in other projects such as the Umpqua Land Exchange and the Sierra Nevada Project.

Appendix C - 2002 Sufficiency Analysis Recommendations

The FPA goals and objectives, as well as most of the state water quality standards and criteria being evaluated in this analysis (temperature and turbidity being the exceptions) are qualitative in nature. Thus, conclusions regarding the effectiveness of the rules in meeting the goals and objectives are qualitative as well. Available data relevant to those quantitative water quality standards (i.e. temperature and turbidity) is inadequate to draw specific and comprehensive conclusions about the adequacy of current practices; therefore, the evaluation of these criteria is also qualitative.

Data in many areas is lacking and, in many cases, not comprehensive. In light of this, any policy decisions made when this report is completed will depend upon professional judgement consistent with available scientific information. As the Board of Forestry considers these recommendations, social and economic factors, along with the scientific evidence on the adequacy of current practices presented here, will be considered as well.

The following recommendations are offered to highlight general areas where current practices could be improved upon to better meet the FPA goals and objectives and, in turn, provide greater likelihood of meeting water quality standards.

Recommendation #1: The RMA basal area retention standards should be revised, where appropriate, to be consistent with achieving characteristics of mature forest conditions in a timely manner; and to ensure that RMAs are providing desirable amounts of large wood and shade over space and time.

Recommendation #2: Revise current practices so desirable amounts of large wood are available along small stream channels that can deliver debris torrents to Type F streams. Ensure that adequate shade is maintained or rapidly recovered for riparian areas along small perennial Type N streams with the potential to impact downstream Type F waters.

Recommendation #3: Provide additional large wood to streams by actively placing the wood in areas where it will provide the greatest benefits to salmonids.

Recommendation #4: Reduce the delivery of fine sediment to streams by installing cross drains to keep drainage waters from eroding slopes. This will allow filtering of sediments and infiltration of drainage water into undisturbed forest soils. Cross drains should not be confused with stream crossing culverts. Cross drains take water from the road surface and ditch and route it under/across the road, discharging the water down slope from the road.

Recommendation #5: Develop specific standards for roads that will be actively used during the wet season. This would include a requirement for durable surfacing of roads in locations where fine sediment can enter streams. This would also include ceasing to haul if roads have not been constructed with effective surface materials, drainage systems, or other alternatives (paving, increased numbers of cross drains, sediment barriers, settling basins, etc.) that minimizes delivery of sediment into streams.

Recommendation #6: Develop specific guidance describing how roads in critical locations would be reviewed to reduce road length, and determining when, despite the relocation, the road location would pose unacceptable risk to resources and not be approved.

Recommendation #7: Construct stream crossings that adequately pass large wood and gravel downstream, and provide other means for passage of large wood and sediment at those crossings that restrict passage. The transport mechanisms for large wood and gravel should include both stream storm flows and channelized debris flows. This would reduce the risk of debris backing up behind the structure, potentially resulting in catastrophic sediment delivery caused by washouts.

Recommendation #8: Develop specific steep-slope, ground-based, yarding practices, or add a prior approval requirement for ground skidding in high-erosion hazard locations.

Recommendation #9: Manage locations most prone to landslides (high-risk sites) with techniques that minimize impacts to soil and water resources. To achieve this objective, best management practices to protect landslide-prone terrain currently in guidance should be incorporated into the forest practice rules, while developing a better case history for evaluating the effectiveness of those practices. These standard practices are designed to minimize ground alteration/disturbance on high-risk sites from logging practices.

Recommendation #10: Provide for riparian functions along stream reaches above impassable stream crossing structures that have a high probability of recolonization by salmonids once the structure is replaced/improved. If an upstream reach has the capacity to be a fish-bearing stream, but is currently a non-fish-bearing stream because a stream crossing structure cannot pass fish, the forest practices rules should be amended so the upstream reach is classified as a fish-bearing stream.

Recommendation #11: Facilitate the identification, prioritization, and restoration of existing culverts that currently do not pass fish. Culvert replacement should be accelerated above what is currently being done, specifically for family forestland owners who often do not have adequate resources to address this issue in a timely manner.

Recommendation #12: Provide a more effective means of classifying streams for "fish use." Revise the forest practice rule definition of Type F and Type N streams using a physical habitat approach to classify fish-use and non-use streams.

The following are specific recommendations for future monitoring:

1. Maintain a riparian monitoring program that continues to monitor the effectiveness of riparian prescriptions and riparian functions to ensure water quality goals are achieved in the future.
2. Monitor improvement of forest roads at a landscape level, looking specifically at implementation of the road hazard and risk reduction project.
3. Evaluate the need for further road compliance and effectiveness monitoring following the completion of the BMP compliance monitoring project relating to road BMPs. Also evaluate the progress and effectiveness of current non-regulatory efforts under the Oregon Plan to upgrade existing culverts that do not pass fish.
4. Monitoring of watershed-scale effects relative to current practices along small Type N streams should be a priority to help narrow the current level of uncertainty.

The following are remaining issues identified in the report that may warrant future examination as additional information is available:

- ? Is the occurrence of blowdown having an effect on meeting the goal of achieving "over time, average conditions across the landscape become similar to those of mature forest conditions" in RMAs?
- ? Are current forest practices meeting the water quality standard with respect to cold-water refugia? (This analysis will not be possible until the DEQ develops the specific guidance necessary to identify cold-water refugia on the ground that can be evaluated against the standard.)
- ? What effect, if any, are current practices along small non-fish-bearing streams having on downstream sediment regimes?

The Board of Forestry is currently deliberating the recommendations introduced by the Forest Practices Advisory Committee (FPAC) in September 2000 along with the 2002 Sufficiency Analysis recommendations. The process of implementing changes to current BMPs will occur over the next few years and is likely to consist of both regulatory and measures. Rules related to fish passage, landslides and roads have been adopted, and the Board is in the final stages of deliberating the recommendations for riparian rules and non-regulatory measures. The ODF monitoring program also began a new series of effectiveness monitoring projects to evaluate BMP sufficiency in protecting riparian functions and water quality.

Appendix D- Best Management Practices Compliance Monitoring Report - Executive Summary

Oregon Department of Forestry
Best Management Practices Compliance Monitoring Project

Executive Summary

OREGON DEPARTMENT OF FORESTRY
FOREST PRACTICES MONITORING PROGRAM
TECHNICAL REPORT 15

April 2002

Oregon Department of Forestry
Best Management Practices Compliance Monitoring Project
Executive Summary

The Oregon Department of Forestry (ODF) regulates forestry operations on non-federal land. Landowners and operators are subject to the Forest Practices Act and Rules when they conduct any commercial activity relating to the growing or harvesting of trees. The Oregon Forest Practices Act (FPA) was adopted in 1972 with the overarching objective to

> …encourage economically efficient forest practices that assure the continuous growing and harvesting of forest tree species and the maintenance of forestland for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water, fish and wildlife resources and scenic resources within visually sensitive corridors as provided by ORS 527.755 that assures the continuous benefits of those resources for future generations of Oregonians. (ORS 527.630 Policy, Oregon Forest Practices Act)

The Oregon Board of Forestry has been vested with exclusive authority to develop and enforce statewide and regional Forest Practice Rules. These rules are designed to address the resource issues identified in the FPA policy (sound management of forest, soil, air, water, fish and wildlife resources, and scenic resources). The Forest Practices Act and Rules are considered a Best Management Practices (BMPs) program. BMPs are defined as practices that are practical and effective at reducing non-point source pollution to standards compatible with water quality goals.

It is the responsibility of the ODF to monitor the effectiveness and implementation of BMPs in achieving that objective.

The Forest Practices Program is responsible for administering and monitoring the Forest Practice Rules. These rules are subject to revision as necessary based on the best available science and monitoring data. Such revisions shall maintain the policy of the FPA as described above. The rules have undergone many revisions since 1972. The most recent changes to the water protection rules were in 1994 and 1995.

Administration of the Forest Practice Rules is done through a balanced program of rule education, technology transfer, incentives, and enforcement. ODF employs 52 forest practice foresters (FPFs), stationed in 25 unit and district offices throughout the state. Through a series of inspections and field visits, FPFs work with landowners and operators to facilitate proper implementation and compliance with the Forest Practice Rules. Not all operations are inspected by FPFs due to extremely heavy workloads, therefore, FPFs prioritize operations to determine inspection schedules. Citation records are a valuable monitoring tool, but a statistically reliable sample of BMP compliance is needed to more precisely determine the degree to which the compliance program is producing the desired results and to identify areas of low compliance. Furthermore, more detailed information is needed on compliance rates of specific practices and rules and to quantify resource damage that occurs as a result of noncompliance.

Monitoring of these BMPs is the responsibility of the Forest Practices Monitoring Program. The monitoring program conducts a variety of projects designed to assess how well current BMPs are achieving their desired goals (effectiveness monitoring) and how well these BMPs are being properly implemented in the field (compliance monitoring).

BMP Compliance Monitoring Project

The ODF Forest Practices Monitoring Program implemented the BMP Compliance Monitoring Project (BMPCMP) to evaluate compliance with BMPs on non-federal forestland. The goal of the BMPCMP was to identify the statewide level of compliance with the Forest Practice Rules relating to the protection of water quality based on a statistically reliable sample. The purposes for this were to determine if adjustments to the administration of the compliance program are needed, identify areas where forest practice rule language can be clarified, and to identify where additional education and training is needed.

This project was conducted with the oversight of both internal and external review committees. These committees provided input and approval of the design, methods, and interpretation of results of this project over a four-year period. The first year of the project (1998) was a pilot study used to revise the site-selection and data collection protocols, determine the needed sample size, and provide preliminary compliance results. During the 1999 and 2000 field seasons, the final version of the BMPCMP was implemented.

A total of 189 harvest operations associated with waters of the state were surveyed for the final version of this project. Operation units were randomly selected and stratified statewide to account for regional differences in the numbers of notifications and types of practices implemented; differences between industrial, non-industrial, and other (generally government) landowners; and heightened concern for fish-bearing streams. Site selection was done so that sample distribution was proportionate to that of the total population of 1998 notifications. The exception to this was an intentional bias towards the selection of units associated with fish-bearing (Type F) streams in order to better assess those rules which would apply only to these sensitive and valued resources. The weakness of this stratification is that it may undersample steep terrain as these units are less likely to have Type F streams.

At selected harvest unit sites, practices and features within that unit (harvest practices, roads, skid trails, riparian management areas, wetlands, etc.) were evaluated for compliance with 150 Forest Practice Rules designed to protect water quality and fish habitat. Please visit http://www.odf.state.or.us/FP/fpmp/default.htm to view the detailed protocol for this project. Stream-crossing structures (bridge, culvert, or ford) were evaluated for fish passage and 50-year stream-flow event capacity using a separate selection process and field protocol. These detailed stream-crossing results are discussed in a report titled *Compliance with Fish Passage and Peak Flow Requirements at Stream Crossings* (Paul, Dent, and Allen, 2001). The stream crossing protocol and final report can be found online at http://www.odf.state.or.us/FP/fpmp/default.htm.

For the BMPCMP, compliance was evaluated for the application of all BMPs relating to water quality on each unit. Each unit was surveyed by a former forest practices forester who evaluated all individual BMP applications as either “compliant” or “noncompliant." A seasonal field crew collected numeric data which was used to quantify compliance for those practices with numeric standards (eg., basal area retention standards in a riparian management area). When noncompliance practices were found, the type and magnitude of resulting riparian and channel impacts were recorded.

BMPCMP Findings

Monitoring Question 1: Compliance Rates. *How often did operators comply with BMPs described in the forest practice rules pertaining to water protection, road construction and maintenance, harvesting, and high-risk sites?*

Unit-Level Compliance

Compliance rates for individual units ranged from 78.8% to 100% (Figure 1) and averaged 96.1%. The majority of units (76%) had at least one noncompliant practice of some sort, and 40% had at least one noncompliant practice that resulted in an impact to riparian and channel conditions.

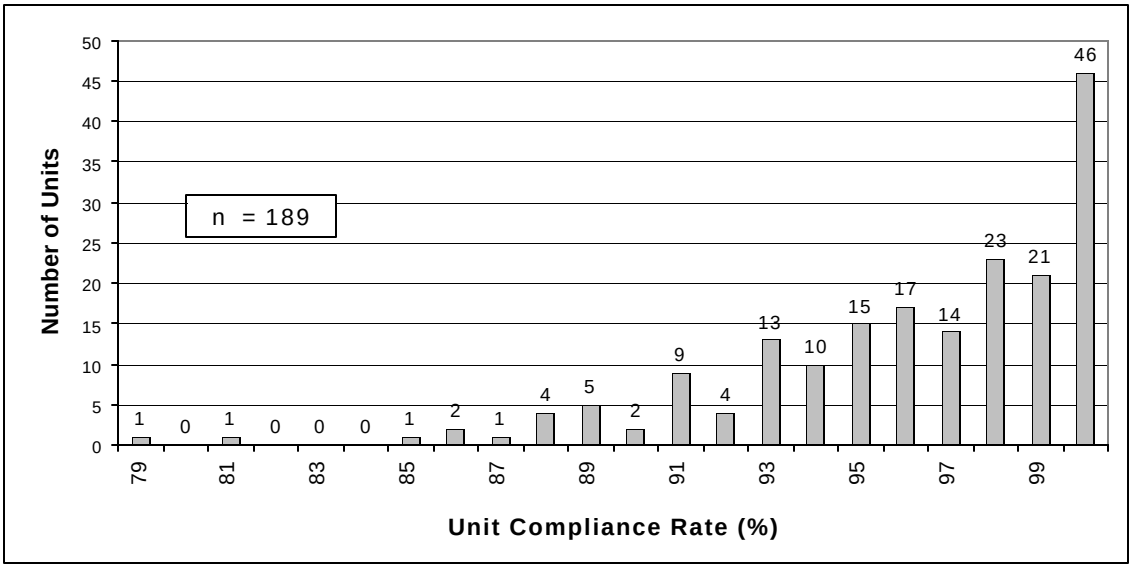

Figure 1. Frequency Distribution of Unit-Level Compliance Rates

The results of this project appear to compare favorably with those reported in other states, although they cannot be compared directly because state rule requirements differ and survey methodologies varied. Oregon's Forest Practice Rules are one of the most detailed and extensive sets of mandatory forestry BMPs in the nation. While it was common to find compliance issues when units were evaluated strictly, it would be an oversimplification to rate compliance solely on existence of a compliance issue of any kind on a unit. An accurate representation of compliance must account for the high numbers of BMPs applied to each unit (average of 71), the specific sources of noncompliance, and impacts to riparian and channel conditions (units had an average of 98.7% of practices with no impact).

Rule-Level Compliance

Compliance was 96.3% for the 13,506 BMP applications reviewed across all 189 units. Of the 502 total noncompliant practices surveyed, 185 (1.4%) were with administrative rules only, 147 (1.1% of all applications) were potential resource issues, and 170 (1.2%) had an impact to riparian or channel resources. These applications were broken into 11 rule sections (Table 1), with section compliance ranging from 69.8% for protection measures for other wetlands, to 100% for rules related to reforestation and operations near waters of the state (WOS).

Table 1. Compliance Rates for Rule Sections

Rule Division	Section Description	Rule Applications	Compliance Rate
629-610	Reforestation (RMA reforestation only)	36	100.0
629-615	Treatment of Slash	1,157	98.2
629-620	Chemicals and Petroleum Products	696	94.3
629-625	Road Construction and Maintenance	2,495	97.6
629-630	Harvesting	6,876	98.1
629-640	Vegetation Retention Along Streams	833	96.4
629-645	Protection Measures for Significant Wetlands	42	88.1
629-655	Protection Measures for Other Wetlands	96	69.8
629-650	Protection Measures for Lakes	0	N/A
629-660	Operations Near WOS	186	100.0
All	Administrative Requirements	1,089	83.0

Monitoring Question 2: Stream Crossing Fish Passage and Peak Flow. *Have stream crossing structures on newly constructed and/or reconstructed roads been designed and installed according to ODF guidelines regarding fish passage and the 50-year peak stream flow event?*

These issues could not adequately be evaluated by the sampling design and survey constraints of this project. A supplemental study was implemented concurrently with this to more accurately address peak flow capacity and juvenile fish passage for newly constructed or reconstructed stream crossings. Results of this project are detailed in ODF Technical Report 14, *Compliance with Fish Passage and Peak Flow Requirements at Stream Crossings* (ODF, 2002[A]). This document can be found online at http://www.odf.state.or.us/FP/fpmp/default.htm.

Monitoring Question 3: Compliance Rates and FPF Inspections. *How do the statistical sample results compare with results based on forest practice foresters (FPF) inspections? Is there a correlation between number of FPF inspections and compliance rates? How statistically representative are the results of this project?*

Forest Practices Forester (FPF) Inspections

The Forest Activities Computerized Tracking System (FACTS) and a civil penalties database were queried for inspection and citation rates for the period of 1995 through 2001. These data are based on the number of citations issued relative to the number of operations that have been inspected by an FPF. Inspection compliance rates during this period showed little fluctuation, with 96.3 to 98.2% of annual operations inspected receiving a citation during this period (Figure 2). The power of these data is in the sheer number of operations assessed. For example, around half of the roughly 18,000 operations completed each year received at least one FPF inspection.

While these results provide a gage for the level of compliance during this period, they cannot be directly compared to compliance rates identified by this study for several reasons. The sample of operations inspected by an FPF consists of prioritized operations within significant time and resource limitations. Conversely, the sample for this project was completely randomly selected and stratified by stream and ownership classes, with an access denial rate of around 4%. FPF inspections also include all applicable

forest practice rules, not just the water-related rules that were the focus of this project. It is also important to note that this project had three people collecting data to evaluate operations at a very strict and technical level of rule compliance. Many of the practices considered noncompliant may not have necessarily warranted a citation.

Although direct correlation between FPF inspections and findings from this project could not be measured with this data, the similar overall compliance rates supports the effectiveness of FPF inspections relative to the findings of this study.

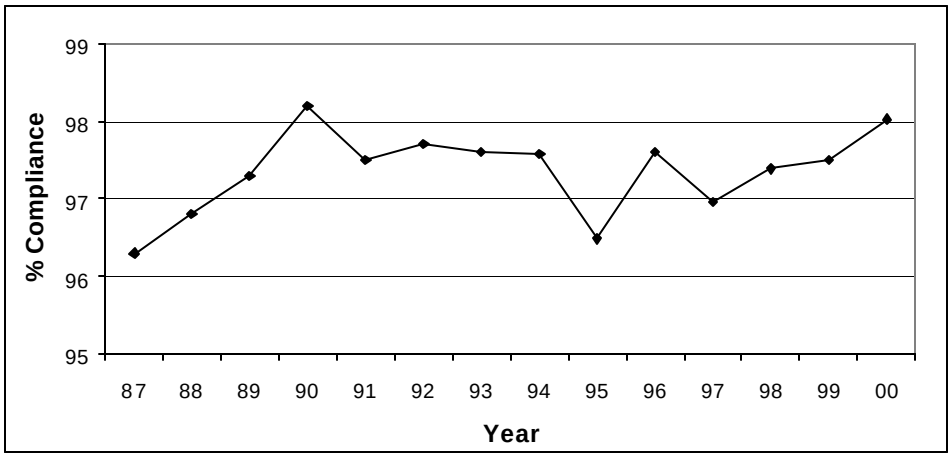

Figure 2. 1987-2000 FPF Inspection Compliance Rates
Rates are based on operations inspected and citations issued for 1987 through 2000.

Statistical Representation

The precision level of the unit-level compliance results can now be calculated with the equation originally used to determine the needed sample size. Using sample size (n), population size (N), and unit-level compliance rate (P), the equation (Freese, 1962) can be solved to give the precision level (E) of these results:

$$n = \frac{1}{\frac{E^2}{(4)(P)(1-P)} + \frac{1}{N}} \quad \text{or} \quad E = [(1/n-1/N)*4*P*(1-P)]^{\wedge 1/2}$$

With a sample size of 189 units surveyed, a population of 4,075 notifications, and an average unit-level compliance rate of 96.1% for the units sampled, the precision level is 0.028. The average compliance rate of the sampled units is therefore representative of the entire population with 97.2% confidence. This confidence level is actually somewhat higher than 97.2% because the identified population greatly overestimates the number of qualifying units. Qualified units were completed operations with a 1998 notification, harvested under the forest practices rules, and associated with some waters of the state. About one-half of the identified notifications reviewed during site selection either did not meet these criteria or did not actually occur.

As well as meeting these criteria, units were selected based on ownership class and stream type stratifications. These results are likely not representative of units selected with different criteria or stratifications. As well, confidence levels cannot be calculated for individual rules surveyed, as this site-selection process likely influenced the sampling rate and distribution of specific practices.

Monitoring Question 4: Areas of Highest and Lowest Compliance. *Are there particular rules that consistently have a higher or lower level of compliance? If the latter, can the guidance and/or rule language be modified to improve compliance? Are there educational and training opportunities/materials regarding those rules?*

Compliance and Sample Size

It is important to first note the role of sample size when assessing the significance of compliance rates for individual rules. It is difficult to assess the scope of a compliance issue in cases where a BMP was applied so few times that one or two noncompliant practices resulted in a low compliance rate. Closer examination shows that average compliance results were highly correlated to sample size, with average compliance much higher for those BMPs applied more often (Table 2). Rules with 1 to 10 total applications (37 rules) had an average rule compliance of 72%, while rules with 11 to 100 total applications (49 rules) had an average rule compliance of 94%, and rules with more than 100 total applications (43 rules) had an average rule compliance of 96%.

Table 2. Average Compliance Rates for Rules Based on Number of Times Applied

Number of Times Rule Applied	Number of Rules	Total Number of Rule Applications	Average Rule Compliance
1-10	37	194	72%
11-100	49	2,685	94%
>100	43	10,627	96%

This trend is encouraging for two reasons: the low compliance results for some rules with small sample sizes is possibly not representative of the larger population; and proper understanding, interpretation, and administration of forest practice rules appears to improve the more they are conducted, as those practices most frequently applied to the landscape were generally most likely to meet BMP compliance.

Areas of Higher Compliance

Given the sample size considerations discussed above, these results still allow for the identification of areas of higher and lower compliance. There were 50 individual rules (39%) with 100% compliance and 72 rules (56%) with 98% or higher compliance. Because of these high numbers, high compliance is identified below for rule groups which have 98% or higher compliance.

- RMA Reforestation Timing (610-040): 100% compliance for two rules (36 applications)
- Chemical Applications (620-400): 98.4% compliance for three rules (129 applications)
- New Road Location (625-200): 100% compliance for three rules (240 applications)
- New Road Prism Design (625-310): 99.4% compliance for seven rules (320 applications)
- Rock Pits (625-500): 100% compliance for five rules (85 applications)
- General Yarding Practices (630-100): 99.5% compliance for three rules (407 applications)
- Cable Yarding near WOS (630-700): 99.7% compliance for five rules (376 applications)
- Landings (630-200): 99.8% compliance for four rules (3,472 applications)
- Vegetation Retention for Type N and D Streams (640-200): 98.8% compliance for eight rules (83 applications)

The general vegetation retention rules for Type F streams (640-100) are not listed above, but are worth mentioning here. Compliance was 97.1% for these six rules, however, the average rates of retention of

RMA vegetation were quite high. All 41 no-harvest prescription Type F RMAs in partial cut units had at least 100% of the required buffer retained. The 52 Type F RMAs with this prescription in clear-cut units had an average of 117% of the required buffer retained. The 62 RMAs with a basal area prescription had an average of 202% of the standard target retained (although only a portion of the basal area above the standard target was likely harvestable due to the limitation of other rules). These prescriptions made up 93% of the total length of Type F RMA surveyed.

Areas of Lower Compliance

There were also 10 specific BMPs identified as having the most significant compliance issues (less than 96% compliance and five or more noncompliant practices). These were: slash piling near WOS, removal of petroleum-related waste, stream crossing fill stability, road surface drainage, felling of trees into small Type N streams, skid trails near WOS, removal of temporary crossings, protection of other wetlands, prior approval requirements, and written plan requirements. These are detailed individually below in order of rule number.

- Mechanical Slash Piling near WOS (615-200 [4]). The placement of mechanically-piled slash in WOS or where it can enter WOS was an issue on 8 of the 77 applicable units (89.6% compliance). Five of these noncompliant practices were slash piled within or on the banks of small Type N streams and three were slash piled in "other" wetlands less than 8 acres in size. Discussions with operators over the course of implementing this project revealed that non-compliance resulted from two factors: operators did not realize that these protection requirements extended to small Type N streams and "other" wetlands, or operators had difficulty identifying small, ephemeral features during the dry season. Discussions of these results with ODF field staff, landowners, and operators have already begun to raise awareness of this issue.

- Removal of Petroleum-Related Waste (630-400 [3]). The removal of petroleum-related waste from the unit following completion of the operation was noncompliant on 34 of the 189 units surveyed (82.0% compliance). These materials (oil filters, grease tubes, and motor and bar oil containers) were generally located at landings, and while none were found to have delivered to WOS, they represent a possible risk to future soil and water quality. Noncompliance was considered to be the result of poor post-operation clean-up practices.

- Stream Crossing Fill Stability (625-320 [1bC]). The design of new stream crossings so that fill and erosion to a channel are prevented was not achieved for 8 of the 51 new crossings surveyed (84.3% compliance). Fill erosion on those eight crossings was attributed to two design issues: over-steepened fills, which enter the channel through ravel or shallow failures, and drainage-caused rutting over ineffectively stabilized fill material.

- Road Surface Drainage (625-330 [1] and 625-600 [2]). Road surface drainage designs that effectively disperse runoff and minimize erosion and proper maintenance of that road surface drainage are critical for resource protection. Compliance with these rules was 86.5% (drainage design) and 94.2% (maintenance), with 31 total noncompliant practices on 171 units with roads. These two rules were considered together because distinguishing compliance issues between ineffective drainage designs and maintenance levels was often extremely difficult. Non-compliance was generally due to a combination of ineffectively designed drainage systems that broke down quickly and did not receive the subsequent required maintenance. These conditions resulted in routing of excessive runoff across the

road surface for great distances, causing erosion and instability. There were 11 cases of sediment delivery attributed to poor drainage design and 10 attributed to a lack of maintenance.

- Felling of Conifers into Small Type N Streams (630-600 [2]). Compliance for felling conifers away from streams and preventing damage to channels was 83.1% on 189 units. The 32 noncompliant practices surveyed were nearly all from the felling of conifers across or into small Type N channels or, to a lesser extent, felling into small wetlands. Fifteen of these resulted in significant slash in WOS, one to channel bed and bank disturbance, and one to sediment delivery to a WOS. Low compliance rates for limiting slash accumulations in Type N steams (630-600 [3b]) and leaving slash where it will not enter WOS (600-400 [1]) were considered to generally result from these noncompliant felling practices. Discussion with operators and ODF field staff while implementing this project revealed that noncompliance was generally associated with interpretation of this rule's application to small Type N streams and other wetlands, especially those which were dry during the time of harvest. Discussion of these results with ODF field staff, landowners, and operators has already begun to raise awareness of this issue.

- Skid Trails Near WOS (630-800 [8] and 630-800 [9]). Harvesting rules also require that skid trails on 106 units not be located within 35 feet of Type F streams (91.5% compliance) and be located so that stream water will not flow onto the skid trail (92.5% compliance). Noncompliant practices consisted of nine units with skid trails located within 35 feet of a Type F stream and eight units with skid trails located within a length of a small Type N stream channel. These resulted in eight cases of channel bed or bank disturbance and six cases of sediment delivery to WOS. Discussion with operators indicated that noncompliance was generally the result of skid trail location rules not adhered to because of operational concerns.

- Removal of Temporary Crossings (630-800 [4e]). The removal of temporary crossing structures following completion of an operation and placement of fill material where it will not enter WOS was done properly for only 11 of 23 temporary crossings surveyed (47.8% compliance). Noncompliant practices include five crossings with fill not removed, two with fill only partially removed, and five with fill material removed but placed where it eroded back into the stream channel. Non-compliance was considered to be simply the result of poor post-operation clean-up practices.

- Protection of Other Wetlands (655-000 [2a & 3]). This rule required protection of soil and water quality for activities along 96 wetlands less than 8 acres ("other" wetlands), seeps, or springs. Compliance was 69.8%, with 29 noncompliant practices in the form of harvesting machinery driven through wetlands, wetlands used as landing areas, trees yarded through wetlands, and slash piled in wetlands. Discussion with landowners, operators, and ODF field staff over the course of implementing this project revealed that noncompliance was generally the result of interpretation of this rule's application to these small wetlands and their identification during the dry season. These discussions have already begun to raise awareness of this issue.

- Prior Approval Requirements. Compliance was evaluated for 13 rules located in several divisions that require department approval for a variety of specified activities. No written prior approval documentation was found for 48 of the 492 activities for which it was required (90.4% compliance). Noncompliance with these requirements was strictly an administrative issue and was not an indicator of compliance for related resource-protection rules. Discussions with landowners, operators, and ODF field staff revealed that the practices addressed by these rules were often considered or discussed with

ODF personnel during the operation, with the compliance shortcoming simply being one of written documentation. Compliance also appears to be closely related to how familiar operators and landowners are with the requirements in question. The two most commonly applied prior approval rules averaged 203 applications each and 97.2% compliance. The remaining 11 rules averaged only eight applications each and 55% compliance.

- Written Plan Requirements. Compliance was evaluated for eight rules located in several divisions that require that detailed information be documented in a written plan for a variety of specified activities. Documentation of adequate information in a written plan was lacking for 136 of 593 total activities for which it was required (77.1%). Noncompliance with these requirements was strictly an administrative issue and not an indicator of compliance for related resource protection rules. Discussions with landowners, operators, and ODF field staff revealed that these requirements were often considered or discussed with the FPF during or before the operation, with the compliance shortcoming being one of written documentation. Noncompliance also occurred in many cases where a written plan was submitted but did not contain a sufficient level of detail to describe activities in question. Compliance issues generally appeared to be the result of a lack of clear understanding of what specific details are required to be in a written plan (This was especially true for providing fish passage. See ODF Technical Report 14).

Monitoring Question 5: Resource Impacts of Noncompliance. *When BMP compliance is inadequate, to what extent are quality and function of riparian areas, stream channels and/or fish habitat compromised?*

Of the 502 total noncompliant practices surveyed, 185 (37%) were with administrative requirements not directly affecting riparian and channel conditions, 147 (29%) had the potential to impact riparian and channel conditions in the future, and 170 (34%) had an observed impact to riparian and channel conditions. The 170 observed impacts resulted from noncompliant practices associated with a range of forest practices rules (Table 3). Each of these instances was categorized as one of four types: significant harvesting slash accumulations below a high water line, significant damage or removal of riparian vegetation, physical alterations of channel bed or banks without sediment delivery, or sediment delivered below a high water line.

Slash Accumulations

Fifty-three noncompliant harvesting slash accumulations were deemed significant enough to impair the water quality of a stream or wetland. These accumulations resulted from trees not felled directionally away from small Type N streams and small wetlands (40), slash on slopes above streams was not disposed of or placed to prevent it from entering the channel after harvest (7), or mechanically-piled slash was placed below a high water line (6). In all these cases, the loading of fine harvesting slash greatly exceeded natural levels.

Table 3. Riparian and Stream Channel Impacts of Noncompliant Practices

Slash = Significant accumulations below a high water line, Vegetation = significant damage or removal of riparian vegetation, Alteration = physical alterations of channel bed or banks without sediment delivery; Sediment Delivery to WOS numeric columns are categorical estimates of volume of sediment delivered in cubic yards.

				Sediment Delivery to WOS (yd3)			
Rule Sub-Section	Slash	Vegetation	Alteration	0-1	1-10	10-100	>100
Reforestation (RMAs only)							
Treatment of Slash	6				1	1	
Chemical and Other Petroleum Products							
Chemical Applications		2					
Petroleum Products							
Road Construction and Maintenance							
Road Location							
Road Prism Design					1		
Steam Crossing Design			2		8	2	
Road Drainage Design				4	7		
Road Waste and Stabilization				4			
Road Drainage Maintenance				5	4	1	
Road Vacating							
Rock Pits							
Harvesting							
General Yarding Practices						1	1
Felling and Harvesting Slash	38		1				
Cable Yarding Near WOS					1		
Ground Equipment Near WOS				2		1	
Harvesting Waste	7			2		3	
Landings							
Skid Trails			8	4	4	1	
Temporary Crossings				5	5	2	
Vegetation Retention Along Streams							
Vegetation Retention - Type F RMAs		23					
Veg. Retention - Type N and D RMAs		1					
Significant Wetlands		2					
Other Wetlands	2	2		2	3		1
Stream Channel Changes							
Total	53	30	11	28	34	12	2

The beneficial and detrimental effects of this material on water quality and channel dynamics is not yet fully understood or quantified. It is believed, however, that large accumulations of fine organic material in streams and wetlands can have the following potential impacts: elevated water temperatures due to artificially widened channels and slowed flows, reduced dissolved oxygen as material decomposes, alteration of channel hydrology and increased erosion, reduced potential for vegetation establishment, short-term retention of sediment, and elevated debris torrent hazard.

Research on clear-cut first- and second-order streams in western Washington (Jackson *et al*., 2001) found several significant short-term effects of heavy slash loading. These include large increases in the amount of fine sediment retained in these channels, shading of channels from direct solar radiation, and reduction of amphibian populations.

Riparian Vegetation Damage

Thirty of the noncompliant practices surveyed resulted in significant damage or removal of riparian vegetation that was required to be retained by the forest practices rules. The retention of vegetation along streams and wetlands is required to maintain water quality, fish and wildlife habitat, and bank stability. The majority of these (23) were failures to fully meet the vegetation retention requirements when harvesting in Type F RMAs. Other noncompliances were for aerial chemical applications to riparian vegetation (2) and with vegetation retention requirements when harvesting along significant wetlands (2), other wetlands (2), and a Type N RMA (1).

Alteration of Bed or Banks

Eleven noncompliant practices resulted in channel alterations with no observable sediment delivery to a stream or wetland. This physical alteration of channel beds or banks can result in immediate and long-term impacts to water quality through altered hydrology, soil compaction, and elevated erosion potential. Most were associated with machinery operated within a channel, either from ground skidding of logs (8) or excessive activity within a channel while constructing a stream crossing (2). The remaining alteration was the result of trees felled into a small Type N streambed.

Sediment Delivery

Seventy-six observations of sediment delivered to a stream or wetland resulted from a wide range of noncompliant practices (Figure 3). The impacts of sediment delivery vary greatly depending on the volume of delivery, stream size, channel morphology, and other site conditions, but in some cases can cause severe resource impacts. These situations can mean unstable slopes and the loss of forest soils, as well as impaired water quality through increased stream temperatures and lowered dissolved oxygen, hindered fish migration and feeding ability, mortality of aquatic invertebrates, and deposition of fine materials which can alter channel hydrology and bury spawning gravels.

Because these surveys were conducted during the dry season, observations of past sediment delivery and estimations of delivery volume were likely to be under-representative of actual erosion rates. The volume of sediment delivered to WOS was estimated within broad categories. Of the total (76), 28 were estimated to be less than 1 cubic yard, 34 were 1 to 10 cubic yards, 12 were 10 to 100 cubic yards, and two were greater than 100 cubic yards (Figure 4). The first of these two largest cases was from poor yarding practices on steep slopes that caused several large shallow failures. The second (on the same unit) was from improper ground skidding within a wetland.

It is important to note that the estimated volume of delivered sediment is not necessarily a measurement of the magnitude of impact that this delivery may have had on the stream channel. The degree to which a volume of delivered sediment will impact a channel can vary greatly depending on the presence of fish and other aquatic species, stream size, channel morphology, habitat conditions, delivery timing, and other factors. The two cases of sediment delivery of greater than 100 cubic yards, for example, were to a small Type N stream and a wetland of less than one acre. Neither of these streams had fish populations, however, such large amounts of sediment delivery to these small features have drastic hydrology and morphology impacts, such as long-term aggradation of the channel downstream.

The greatest source areas of sediment delivery were from 36 noncompliant road construction and maintenance practices. Specific sediment source areas were ineffective road drainage design (11), inadequate road drainage maintenance (10), eroding stream crossing fill (10), unstabilized road waste (4), and an unstable road prism design (1). The other main sources of sediment delivery were from 32 noncompliant harvesting practices. Specific source areas were poorly removed temporary crossings (11), ineffectively drained skid trails near streams (9), unstablized harvesting waste (5), harvesting equipment operated in stream channels (3), yarding gouges on steep slopes (2), trees felled into a channel (1), and

trees yarded through a stream channel (1). The remaining delivery observations were from infractions of small wetland protection requirements (6), and slash-piling machinery operated in WOS (2).

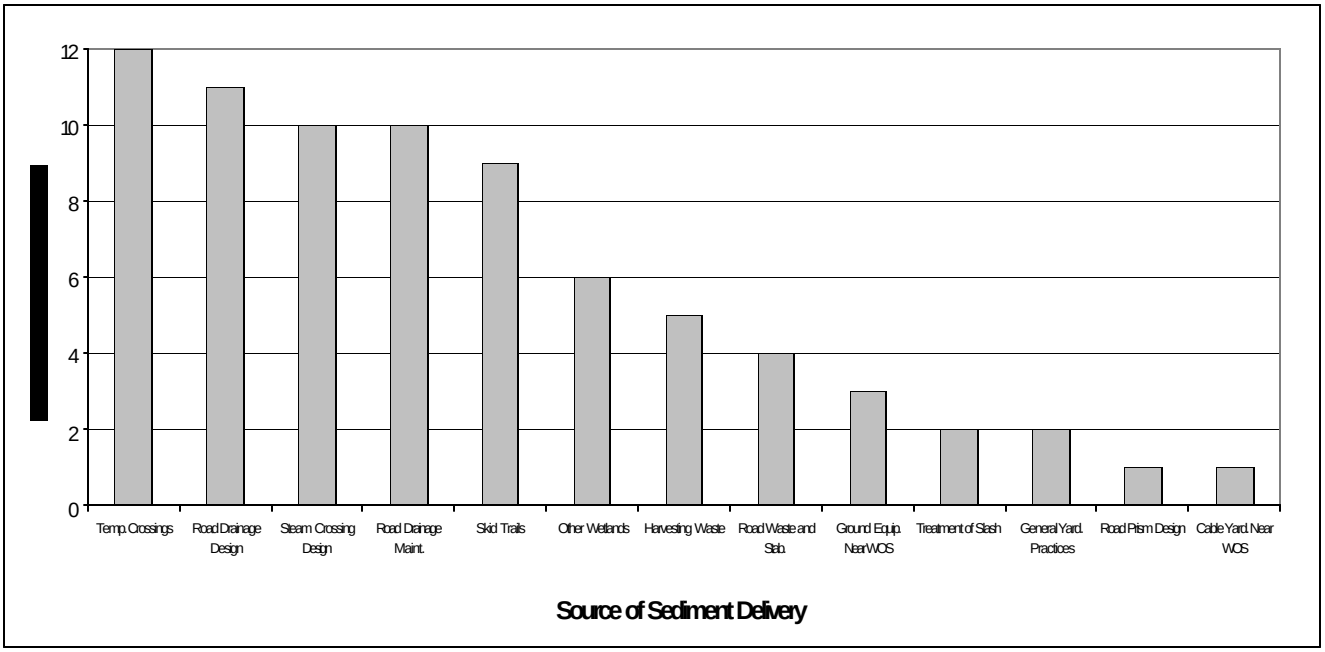

Figure 3. Distribution of Sediment Delivery Sources

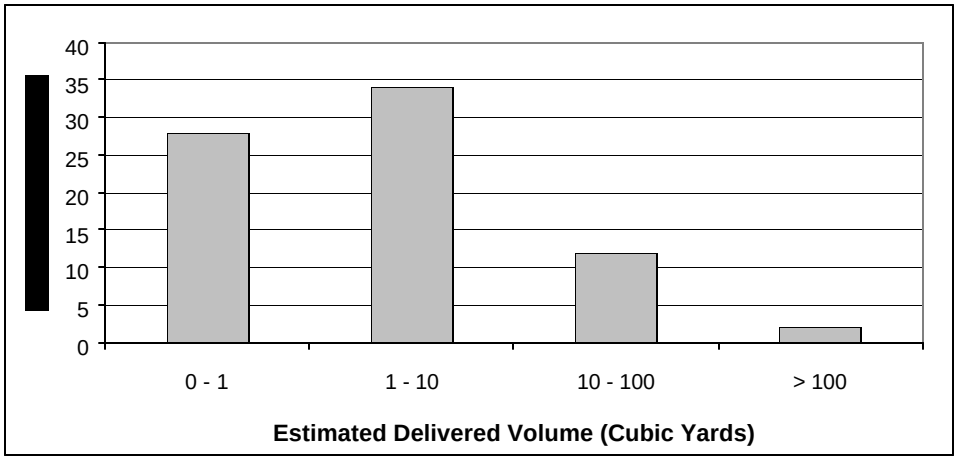

Figure 4. Distribution of Sediment Delivery Volumes from Noncompliant Practices

References

Freese, Frank. December 1962. Elementary Forest Sampling. Agriculture Handbook No. 232. USDA Forest Service. 87 pp.

Oregon Department of Forestry. 2002[A]. Compliance with Fish Passage and Peak Flow Requirements at Stream Crossing. ODF Technical Report 14. Oregon Department of Forestry, 2600 State Street, Salem, Oregon 97310. 59 pp.