

Washington

Forest Practices Board



DRAFT

**Environmental
Impact
Statement**

on

**Forest Practices Road
Maintenance
Abandonment Planning
(RMAP)**

Responsible Official:
Doug Sutherland
Commissioner of Public Lands

Contact Person:
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EIS Project Coordinator

Published:
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October 2005

Dear Reviewer:

The Forest Practices Board is considering rule changes to Title 222 WAC, *Forest Practices*. The changes are intended to limit the burden on small forest landowners from forest road maintenance and abandonment planning requirements and the cost associated with removal of fish passage barriers due to forest roads.

In 2003 the Washington State Legislature amended portions of chapters 76.09 and 76.13 RCW (Second Substitute House Bill 1095) to ensure the rules pertaining to road planning and fish passage do not disproportionately affect landowners who harvest no more than an average timber volume of two million board feet per year. The Board adopted emergency rules effective October 31, 2003 to implement that legislation.

Since that time, the Department of Natural Resources, on behalf of the Board, and stakeholder representatives including agencies, landowner groups, and the Northwest Indian Fisheries Commission, have drafted permanent rule language to replace the emergency rule. This draft environmental impact statement (EIS) provides analysis to assist the Board in its decision to adopt permanent rules.

We welcome your written comments on this analysis and the rule proposals described in it. We also invite you to attend and comment to the Board in person at any of the five public hearings to be held in November and December 2005. Please see the enclosed Fact Sheet for details.

The Board will accept comments until December 16, 2005. We expect to complete a final EIS in February or March and adopt a permanent rule in the spring of 2006. I sincerely appreciate your interest in this topic and welcome your comments.

Sincerely,

A handwritten signature in blue ink that reads "Doug Sutherland".

Doug Sutherland
Commissioner of Public Lands

Fact Sheet

This proposal involves amending Title 222 WAC, Forest Practices to limit the burden on small forest landowners from forest road maintenance and abandonment planning requirements and the costs associated with removal of fish passage barriers due to forest roads.

Proposed by:

Washington State Forest Practices Board

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Fact Sheet

Date of Issue of DEIS:

November 1, 2005

Comment Deadline:

December 16, 2005

Hearing Dates and Locations:

November 17, 6 p.m., Omak
Sun Valley Restaurant

November 29, 6 p.m., Colville
Community College of Spokane

December 1, 6 p.m., Kelso
Red Lion Hotel, 510 Kelso Drive

December 13, 6 p.m., Walla Walla
Walla Walla Community College

December 15, 6 p.m., Everett
Inn at Port Gardner

Proposed Rule Adoption Date:

May 10, 2006

Reference Material and Data Located at:

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Distribution List

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Acronyms

BMP	best management practices
CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DNR	Washington State Department of Natural Resources
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FFFPP	Family Forest Fish Passage Program
FPA/N	forest practices application/notification
FPB	Forest Practices Board
GIS	geographic information system
HCP	Habitat Conservation Plan
LWD	large woody debris
MMBF	million board feet
NEPA	National Environmental Policy Act
NIPF	non-industrial private forest
NMFS	National Marine Fisheries Service
NWI	National Wetlands Inventory
RCW	Revised Code of Washington
RMAP	road maintenance and abandonment plan
RTI	Rural Technology Initiative
SEPA	State Environmental Policy Act
SSHB	Second Substitute House Bill
TFW	Timber/Fish/Wildlife
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife

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INTRODUCTION

The Washington Forest Practices Board (FPB) proposes to modify the state forest practices rules (Title 222 WAC). Its objective is to address the unforeseen and unintended financial hardship placed on small forest landowners by road maintenance and abandonment plan (RMAP) planning requirements.

The RMAP planning requirements are part of a package of rules adopted in 2001 (hereinafter referred to as the 2001 rules) to address the needs of salmon and other aquatic and riparian species on forest lands. Under the 2001 rules, landowners are required to plan road maintenance and abandonment activities and repair fish passage barriers within fifteen years of the date the rules became effective.

In 2003 the Washington State Legislature amended portions of chapters 76.09 RCW, “Forest Practices,” and 76.13 RCW, “Stewardship of Non-industrial Forests and Woodlands,” to limit the burden on small forest landowners from RMAP requirements (Second Substitute House Bill 1095). The FPB then passed *temporary* (emergency) rules reflecting those statutory amendments.

The proposed *permanent* rule changes (the subject of this document) pertain to those same statutory amendments. The FPB will also decide whether to adopt rule changes to clarify definitions of “road construction” and “road maintenance” for all landowners subject to rules.

This Draft Environmental Impact Statement (EIS) has been prepared under the guidelines and requirements of the State Environmental Policy Act (SEPA) to analyze any significant adverse environmental impacts of the alternative proposals. Based on a full analysis of the proposal and reasonable alternatives, the FPB will determine how to modify the 2001 permanent rules.

This summary section provides a brief description of the purpose and need for action, the significant issues that have been identified related to the action, and environmental impacts of the proposal and the alternatives.

Throughout this document there are references to the FPB and the Department of Natural Resources (DNR). It is important to note the relationship between them: the FPB sets minimum standards for forest practices by adopting forest practices rules (taking direction from the legislature), and DNR administers the rules and provides administrative support to the FPB.

PURPOSE AND NEED FOR ACTION

The purpose of this rule proposal is to mitigate the unintended financial consequences of the 2001 RMAP planning requirements for small forest landowners in order to implement Second Substitute House Bill (SSHB) 1095. This rule proposal must maintain the resource protection standards established in the Forest Practices Act (chapter 76.09 RCW).

Based on a full analysis of the rule proposal and reasonable alternatives, the FPB will determine how to modify the 2001 permanent rules.

SSHB 1095 directed the FPB to develop rules to implement a simplified RMAP planning procedure and financial assistance for small forest landowners to fix fish passage barriers. The FPB must ensure the amended rules do not reduce standards for protection of public resources established in the Forest Practices Act (chapter 76.09 RCW).

Summary

As a result of both public and internal scoping, the following environmental elements have been identified for analysis:

- Hydrology
- Water Quality
- Riparian Habitat
- Wetlands
- Fish
- Wildlife

RELATED REQUIREMENTS AND DOCUMENTS

SEPA rules (chapter 197-11 WAC) require an EIS to analyze the significant environmental impacts of government actions. Impacts not considered to be significant do not need to be addressed. The responsible agency will consider the EIS as one of potentially several pieces of information necessary in the decision-making process. The EIS is not required to evaluate and document all possible effects and considerations, such as economic competition, personal income and wages, and social impacts. Therefore, the focus of this document is to compare a reasonable range of alternatives and analyze the environmental impacts for significant issues.

Economic impacts related to the proposed rule changes are addressed separately by a small business economic impact statement required by the Regulatory Fairness Act (chapter 19.85 RCW) and a cost benefit analysis required by the Administrative Procedure Act (chapter 34.05 RCW). The small business economic impact statement analyzes the disparity of the impact of rules on large businesses versus small businesses. Both of these documents are to be posted on the FPB website (dnr.wa.gov/forestpractices/rules/) in one document, “RMAP Economic Analysis.” This analysis is also available from the DNR Forest Practices Division (360) 902-1400.

ALTERNATIVES AND IMPACTS

Three alternatives are considered in this EIS: the No Action Alternative (Alternative 1); the proposed action – rule amendments shown in Appendix A, but excluding the changes to the “road construction” and “road maintenance” definitions (Alternative 2); and the Preferred Alternative – rule amendments shown in Appendix A including changes to the “road construction” and “road maintenance” definitions (Alternative 3). The three alternatives are described in detail in Chapter 2 and summarized below.

- **Alternative 1** represents the No Action Alternative. It entails continuing with the road maintenance and abandonment planning requirements of the 2001 rules. [Please note that emergency rules have been effective since October 2003 pursuant to SSHB 1095. Alternative 1 represents the 2001 permanent rules, not the emergency rules currently in effect.] Under this alternative, all forest roads must be covered under an approved RMAP by July 1, 2006. RMAPs would be required for all forest landowners regardless of ownership size, amount of timber harvest, or timing of submission of a forest practices application/notification (FPA/N). The road work and the fish passage blockage repairs identified in the RMAP would be required to be accomplished by 2016 (see Section 1.1.1 Forest Practices Rules for a further explanation of the due dates). The repairs would be expected to reduce road-related sediment, reduce potential mass wasting of roads, and improve hydrologic connectivity. Roads would be prioritized for repair based on road assessments. Landowners would also submit plans for standard road maintenance practices; pre-storm planning, emergency, and

post-storm inventory and restoration practices; inventories of orphaned roads that pose risks to public safety and/or resources; and detailed work plans.

- **Alternative 2** represents permanent rules to implement SSHB 1095. These rules would simplify RMAP planning requirements for small forest landowners; would define “small forest landowner,” “forest road,” and “forest land” for small forest landowner RMAP planning purposes; and would describe a cost-share program available to them for the removal or repair of fish passage barriers. Small forest landowners would be partially defined as forest landowners with an annual timber harvest of two million board feet (MMBF) of timber per year. Under this alternative, small forest landowners would be required to complete a Checklist RMAP when submitting an FPA/N. However, small forest landowners with 80 acres or less of forest land who are submitting an FPA/N for harvest of 20 acres or less of contiguous forest land (hereinafter referred to as “80/20 landowners”) would not be required to submit an RMAP, Checklist or otherwise. Alternative 2 also includes a cost-share program (the Family Forest Fish Passage Program [FFFPP]) for small forest landowners, which would provide state financial and technical assistance for removal of fish passage barriers and installation of fish passable structures. Fish passage barriers on small forest landowner properties would be prioritized for removal or repair on a worst-first basis, with consideration for the greatest benefit to fish.
- **Alternative 3**, the FPB’s Preferred Alternative, includes all of the provisions of Alternative 2, but with certain clarifications to the definitions of “road construction” and “road maintenance.”

ENVIRONMENTAL IMPACTS & CONCLUSIONS

The environmental impacts on water resources, riparian habitat, wetlands, fish and wildlife vary with the proposed alternatives. This section summarizes the impacts on those resources and includes the major conclusions and significant areas of controversy and uncertainty. The environmental effects of Alternatives 2 and 3 were not expected to differ from each other; therefore, the two alternatives are addressed together in this document.

Water Resources (Hydrology and Water Quality)

Alternative 1

Alternative 1 would result in a low risk of road-related sediment delivery persisting after 2016. Site evaluations (RMAPs) would be completed by 2006 for all roads on each forest landowner’s property. Similarly, Alternative 1 would pose a low risk of ongoing sediment delivery to surface waters because the identified repairs in each RMAP would be required of all small forest landowners by 2016.

Alternatives 2 and 3

Alternatives 2 and 3 could result in an elevated risk of road-related sediment delivery persisting after 2016. Site evaluations for most small forest landowners would be completed only when FPA/Ns are submitted, and only for roads used under the FPA/N. Eighty/twenty landowners would be exempt from RMAP planning requirements.

Alternatives 2 and 3 could result in an elevated risk of ongoing sediment delivery to surface waters because some road problems may not be identified and repaired until Checklist RMAPs and/or FPA/Ns are submitted.

Summary

Riparian Habitat

There would be no change in large woody debris (LWD) related to existing road corridors under any of the alternatives, nor would there be any change in resource protection standards set by the forest practices rules under any of the alternatives.

Alternative 1

Alternative 1 would likely result in a low probability of increased LWD from road failures on small forest landowner forest roads because RMAPs and repairs would be required by 2016. For the same reason, Alternative 1 would result in a low risk after 2016 of failures causing disturbance to riparian buffers that aid in sediment control and stream bank stability.

Alternatives 2 and 3

Relative to Alternative 1, Alternatives 2 and 3 would likely result in an elevated risk of road failures on small forest landowners forest roads after 2016 because of the possibility of some road problems not being identified and repaired until Checklist RMAPs and/or FPA/Ns are submitted. Road failures may result in disturbance to riparian buffers that aid in sediment control and stream bank stability.

Wetlands

Under all three alternatives, roads in wetlands would continue to affect wetland connectivity and fish and wildlife habitat quality. There would be no change in these ongoing effects under any of the alternatives, nor would there be any change in resource protection standards set by the forest practices rules under any of the alternatives.

Alternative 1

Alternative 1 would likely result in (1) a low risk of ongoing sediment delivery to wetlands adjacent to eroding or failing roads, (2) a low risk that road sections with inadequate drainage structures might not be identified and corrected, (3) a low risk of ongoing sediment delivery to wetlands, and (4) a low risk of further degradation to fish and wildlife habitat, because repairs would be required of all forest landowners subject to the forest practices rules by 2016.

Alternatives 2 and 3

Relative to Alternative 1, Alternatives 2 and 3 would likely result in (1) an elevated risk of ongoing sediment delivery to wetlands adjacent to eroding or failing roads, (2) an elevated risk that road sections with inadequate drainage structures might not be identified and corrected, (3) an elevated risk of ongoing sediment delivery to wetlands, and (4) an elevated risk of further degradation to fish and wildlife habitat, because of the possibility of some road problems not being identified and fixed until Checklist RMAPs and/or FPA/Ns are submitted by small forest landowners.

Fish

Under all three alternatives, stream-adjacent parallel roads would continue to affect important elements of fish habitat, including LWD and leaf and needle recruitment, floodplains, off-channel habitat, water temperature, and dissolved oxygen. Under any of the alternatives, there would be no change in these ongoing effects and no change in resource protection standards set by the forest practices rules.

Alternative 1

Alternative 1 would result in (1) a low risk of adverse hydrologic impacts from road sections needing upgraded drainage structures, (2) a low risk of ongoing sediment delivery to streams, and (3) a low risk of ongoing effects of forest chemicals to streams, because RMAPs would be required of all private forest landowners by 2006.

Alternative 1 would also result in a high regulatory certainty that fish passage barriers on small forest landowner properties would be fixed by 2016. However, some small forest landowners may change their land management strategy (i.e., the timing or magnitude of timber harvest, land sales, or conversion) in order to finance installation of fish passage structures.

Alternatives 2 and 3

Relative to Alternative 1, Alternatives 2 and 3 would likely result in (1) an elevated risk of adverse hydrologic impacts from road sections needing upgraded drainage structures, (2) an elevated risk of ongoing sediment delivery to streams, and (3) an elevated risk of ongoing effects of forest chemicals to streams, because of the possibility of some road problems not being identified and fixed until Checklist RMAPs and/or FPA/Ns are submitted.

Alternatives 2 and 3 could result in an elevated risk that some fish passage barriers on small forest landowner properties would not be fixed by 2016, because some small forest landowners may not apply to the FFFPP and passage barriers on their lands may not be identified or fixed until Checklist RMAPs and/or FPA/Ns are submitted, which could occur after 2016. The FFFPP provides greater certainty that fish passage barriers would be fixed in a cost-effective fashion that fixes barriers on a worst first basis. Uncertainty exists in the funding sources and levels to be available to the FFFPP; however, check-ins with the legislature in 2008 and 2013 increase the probability that goals for fixing barriers would be met by 2016.

Wildlife

Alternative 1

Alternative 1 would result in a low risk of aquatic habitat impacts from ongoing sediment delivery to streams because RMAPs would be required of all non-federal forest landowners by 2006.

Alternatives 2 and 3

Relative to Alternative 1, Alternatives 2 and 3 would likely result in an elevated risk of habitat impacts from ongoing sediment delivery to streams because of the possibility of some road problems not being identified and repaired until Checklist RMAPs and/or FPA/Ns are submitted.

Summary

Cumulative Effects and Possible Area of Uncertainty

Small forest landowners own approximately 26 percent of the forest land regulated by the forest practices rules in Washington State and about 18 percent of forest lands available for timber management (including federal and tribal forest lands). As much as 20 percent of the fish passage barriers on forest land regulated by forest practices rules in Washington State may occur on small forest landowner properties. These percentages suggest that the lack of reporting, a simplified RMAP planning process, and the elimination of required RMAP scheduling for small forest landowners under Alternatives 2 and 3 have the potential for substantial cumulative effects on natural resources in Washington. Resources potentially affected by runoff-related impacts to public surface waters from problem road segments would include water quality, riparian areas, fish resources, wetlands, and habitat quality for stream-dwelling amphibians.

Adverse effects could occur if the Checklist approach cannot meet the goal described in WAC 222-24-010 (see Appendix A). However, Alternatives 2 and 3 offset potential effects by including check-in points with the legislature in 2008 and 2013 to evaluate the progress of the Checklist RMAP approach in meeting the goal of completing all needed repairs by 2016.

CONCLUSION

Proposed rule changes under Alternatives 2 and 3 would reduce the level of RMAP planning requirements for small forest landowners and provide a cost-share program (the FFFPP) for fixing fish passage barriers on small forest landowner properties. Consequently, some small forest landowner RMAPs would not be completed as soon as under Alternative 1 (2001 rules), and 80/20 landowners would not be required to complete RMAPs. Reduced opportunities for oversight and enforcement of resource protection associated with reduced RMAP planning requirements would be expected to pose an increased risk of adverse environmental impacts, because some road-related problems would have a higher risk of not being detected or addressed in a timely manner. Probable significant adverse environmental impacts related to proposed changes in RMAP planning requirements would thus include an increased risk to water quality and aquatic resources from fine sediment associated with road runoff.

With respect to the cost-share program, Alternatives 2 and 3 would pose an increased risk that some fish passage barriers on small forest landowner properties would not be resolved by 2016, because some small forest landowners may not apply to the FFFPP and passage barriers on their lands may not be identified or fixed until checklist RMAPs and/or FPA/Ns are submitted, which may occur after 2016.

Such impacts would, however, continue to be mitigated by ongoing compliance monitoring and monitoring for the adaptive management program, which are designed to ensure corrective actions for any forest roads that are causing or have the potential to cause damage to a public resource.

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1.1 BACKGROUND

In order to better understand the proposal to modify the forest practices rules, it is helpful to understand the context of the proposed change and the process required to make that change. This chapter provides background on the rules, the purpose and need behind the proposed change, the scoping process under the Washington State Environmental Protection Act (SEPA), and the decision-making process.

1.1.1 Forest Practices Rules

In 1974, the Washington State Legislature passed the Forest Practices Act (chapter 76.09 RCW). It created a Forest Practices Board (FPB) to adopt rules to protect soils, water, fish, wildlife, and public capital improvements from impacts of forest practices. The forest practices rules were adopted in 1977 and published as Title 222 WAC.

In 1986, forest stakeholders representing the tribes, the Departments of Natural Resources, Fisheries, Game, and Ecology, the timber industry, landowners, and environmental interest groups met to determine if they could collaboratively negotiate an agreement upon which to base new, more-protective forest practices rules. It was hoped that the agreement would resolve contentious forest practices issues and protect natural resources. The stakeholder negotiation process became known as Timber/Fish/Wildlife (TFW) and resulted in the Timber/Fish/Wildlife Agreement (February 1987). In September 1987, the Washington FPB adopted new forest practices rules resulting from successful TFW collaborative negotiations that strove to protect public resources and maintain a viable timber industry. Another major rule package was adopted in 1992, followed by rules for the Northern Spotted Owl (1996) and the Marbled Murrelet (1997).

In 1997, the TFW participants were faced with an imminent listing under the Endangered Species Act (ESA) of several salmon species in Washington, as well as new information from watershed analysis and other sources indicating the riparian protection was not adequate for public resources. The TFW participants once again agreed to negotiate collaboratively in an effort to submit a proposal to the FPB. This process became known as the “Forests and Fish” negotiations and the participants’ recommendations can be seen in a document called the “Forests and Fish Report” (www.dnr.wa.gov/forestpractices/rules/).

Chapter 1

This report is the basis for forest practices rules that would enhance salmon and other aquatic resources on forest lands.

In 1999 the legislature recognized the Forests and Fish Report recommendations by passing the 1999 Salmon Recovery Act (Chapter 4, Laws of 1999, 1st Special Session, Engrossed Substitute House Bill 2091). To address salmon recovery this act directed the FPB to adopt rules related to riparian habitat management, including the maintenance and abandonment of forest roads to prevent sedimentation and fish blockages in water bodies, and required mandatory road maintenance and abandonment plans (RMAPs).

The alternatives considered were evaluated in the environmental impact statement (EIS) on Alternatives for Forest Practices Rules for Aquatic Resources (Forest Practices Rules EIS; Washington FPB, 2001). The selected alternative, Alternative 2, was implemented as the 2001 rule package that incorporates the Forests and Fish Report; this rule package is hereinafter referred to as the 2001 rules.

The 2001 rules required forest landowners to submit an RMAP for all of their forest roads to the Department of Natural Resources (DNR) within five years of the effective date of the rule or by December 31, 2005. The rule was effective July 1, 2001; therefore, DNR set the RMAPs due date for July 1, 2006 – five years after the effective date of the rule. The 2001 rules also required forest landowners to report work accomplishments annually (WAC 222-24-051) and to improve and maintain all forest roads to the standards of chapter 222-24 WAC within 15 years of the effective date of the rule (WAC 222-24-050).

1.1.2 Legislative Direction

After the 2001 rules were adopted, it became apparent that mandatory RMAP and new fish passage requirements could cause a greater disproportionate financial hardship on small forest landowners than anticipated. The legislature addressed this in 2003 by enacting Second Substitute House Bill (SSHB 1095), which required emergency rule making by October 2003, to be followed by permanent rule making to assist small forest landowners with the forest RMAP planning elements of the rules.

1.2 PURPOSE AND NEED

1.2.1 Purpose

The purpose of this rule proposal is to mitigate the unintended financial consequences of the 2001 RMAP planning requirements for small forest landowners in order to implement SSHB 1095 while maintaining the resource protection standards established in chapter 76.09 RCW, Forest Practices Act.

1.2.2 Need

In 2003, the Washington State Legislature directed the FPB to develop rules to implement SSHB 1095. This direction was prescriptive and detailed. It included simplified RMAP planning and financial assistance for correcting fish passage barriers for small forest landowners. The legislature did not change its previous intent to adopt rules consistent with recommendations contained in the Forests and Fish Report. Therefore, this rule proposal must not reduce standards for protection of public resources.

1.3 SCOPING AND THE SIGNIFICANT ISSUES

The first step in preparing an EIS is to conduct scoping. Scoping serves four main purposes:

1. Refine the probable significant adverse impacts to be addressed in the EIS.
2. Eliminate elements of the environment that are not deemed significant from detailed study in the EIS.
3. Develop a list of reasonable alternatives that meet the FPB's goals.
4. Identify potential measures to mitigate for the anticipated probable adverse impacts of the proposal.

Scoping can also help determine the level of analysis and the types of data required for analysis.

1.3.1 Scoping

DNR issued a scoping notice for the RMAP environmental analysis on March 4, 2005. This document advised the public that the FPB intended to prepare an EIS on modifications to the forest practices rules. It also requested suggestions and information on the scope of environmental issues to be addressed in the EIS. In this notice, DNR identified six discussion topics to address in the EIS as follows:

1. The number of small forest landowners who meet the new legislative definition of small forest landowners.
2. The process by which water quality protection and fish passage barriers are addressed by small forest landowners.
3. The effects of prioritizing fish passage barrier repair on a worst first basis within the watershed.
4. The benefits and effectiveness of the state led cost-share program (Family Forest Fish Passage Program) as it relates to fish habitat and small forest landowners.
5. The impacts of simplified RMAP planning for small forest landowners and limitations to planning area.
6. Clarifying the existing definitions of road maintenance and road construction.

Comments were due to the FPB by March 31, 2005. Four letters were received. DNR reviewed and revised the discussion topics and alternatives to reflect the comments received.

In addition to public scoping, an internal team of specialists added the following two discussion topics:

7. The impacts of excluding or not excluding Checklist RMAPs from multiyear permit opportunity.
8. The effects of the definition changes to road construction and maintenance.

1.3.2 Significant Issues

SEPA requires the preparation of an EIS to analyze impacts of proposed projects in the State of Washington that are deemed to have probable significant adverse impacts to either the natural or built environment (WAC 197-11-440). Impacts that are not considered significant, as well as social or economic impacts, do not have to be analyzed in an EIS.

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Based on public and internal scoping, the following elements of the environment (i.e., resource areas) are considered in this analysis:

- **Hydrology:** Effects on the hydrology of forested watersheds, particularly regarding peak flows, and the resultant effect on fish habitat and flood damage.
- **Water Quality:** Effects on surface and ground water quality from mass wasting, surface erosion, and sediment delivery.
- **Riparian Habitat:** Effects on riparian vegetation for large woody debris (LWD), maintenance of shade for water temperature protection, maintenance of stream bank stability, leaf and needle litter recruitment, and microclimate protection.
- **Wetlands:** Effects on wetlands and associated functions.
- **Fish:** Effects on fish passage, water quality for fish, fish habitat elements, channel conditions and dynamics, and watershed conditions relative to road maintenance.
- **Wildlife:** Effects on the quality and quantity of riparian habitat, wetland habitat, and other aquatic habitat for wildlife (especially unique habitats, known to be priority habitats for certain aquatic species).

Six of the topics listed in Section 1.3.1 are addressed within the context of resource-specific analyses. However, two of the topics listed above are not addressed in this EIS; these are Topics 1 and 7. With respect to Topic 1, the number of forest landowners that may be affected by the new definition of small forest landowner is considered a social or economic effect and is thus not within the scope of a SEPA EIS. With respect to Topic 7, preliminary analyses of potential impacts to resources did not identify any probable significant adverse impacts associated with excluding or not excluding Checklist RMAPs from multiyear permits; therefore, this topic also is excluded from this analysis.

Effects on **cultural resources** and **wildfire** were analyzed in the EIS for 2001 rule package. This RMAPs rule proposal does not change the conclusions reached in that EIS; i.e., it does not change the circumstances that require SEPA analysis. In addition, preliminary analysis found that certain aspects of some elements of the environment would not be affected by potential changes in RMAP planning requirements. These aspects are identified in the individual resource analyses.

1.3.3 Other Issues and Related Documents

As stated above, SEPA requires an EIS to analyze the significant impacts of a proposal (WAC 197-11-440). Unless impacts are considered to be significant, they do not need to be addressed. Further, SEPA emphasizes that an EIS should analyze the environmental impacts (WAC 197-11-448). The intent is that the responsible agency will weigh the EIS as one of potentially several pieces of information necessary in the decision-making process. The EIS is not required to evaluate and document all possible effects and considerations, such as economic competition, personal income and wages, and social impacts. Therefore, the focus of this document is on a comparison of a reasonable range of alternatives and an analysis of the environmental impacts for significant issues.

Notably, Alternative 1 is the same as Alternative 2, the selected alternative, of the Forest Practices Rules EIS (Washington FPB, 2001). The proposed rule changes addressed in this EIS are also considered in the Forest Practices Rules Habitat Conservation Plan (Forest Practices Rules HCP) Draft EIS (National Marine Fisheries Service [NMFS] and U.S. Fish and Wildlife Service [USFWS], 2005). That EIS is a National Environmental Policy Act

(NEPA) document that analyzes the effects of implementing the 2001 rules, including SSHB 1095, as a statewide HCP. The RMAP requirements included in the alternatives analyzed in these EISs were considered in combination with a multitude of other changes in forest practices rules proposed at that time. This EIS analysis focuses specifically on the RMAP requirements of the 2001 rules and SSHB 1095, but does not reanalyze the alternatives presented in the other EISs. The effects are described at a level of resolution deemed necessary to compare alternatives and make a reasoned decision by which to proceed.

Economic impacts related to the proposed rule changes are addressed separately in an economic analysis developed for the FPB. It combines the small business economic impact statement required by the Regulatory Fairness Act (chapter 19.85 RCW) and a cost benefit analysis required by the Administrative Procedure Act (chapter 34.05 RCW). The RMAP Economic Analysis (Krug, 2005) analyzes the disparity of the impact of rules on large businesses versus small businesses. The preliminary analysis is available on the FPB website at <http://www.dnr.wa.gov/forestpractices/rules/>.

1.4 DECISION TO BE MADE

This Draft EIS provides information that the FPB will use in determining permanent forest practices rules pursuant to SSHB 1095. On August 10, 2005, the FPB approved draft rules for formal public review. That public review period began on September 7, 2005, with the publishing of the draft rule in the Washington State Register.

Five public hearings will be held around the state where DNR will gather comments from the public on the proposed rule language, the draft economic analysis, and this Draft EIS. The hearings will begin at 6:00 p.m. The dates and locations of the hearings are as follows:

- **Omak** – Thursday, November 17, 2005, at the Sun Valley Restaurant
- **Colville** – Tuesday, November 29, 2005, at the Community College of Spokane
- **Kelso** – Thursday, December 1, 2005, at the Red Lion Kelso
- **Walla Walla** – Tuesday, December 13, 2005, at Walla Walla Community College
- **Everett** – Thursday, December 15, 2005, at the Inn at Port Gardner

The public comment period will close December 16, 2005. DNR will analyze all comments through the end of the year and will schedule a stakeholder meeting during January or February to discuss the comments and possible adjustments to the draft rules.

The FPB will then finalize the rules using the following information:

- Public comments on the Draft EIS
- Final EIS
- The Economic Analysis (small business economic impact statement and cost benefit analysis)
- Public comments on the proposed rules

The proposed rules would be adopted with agreement from the Washington Department of Ecology (WAC 222-12-010). The FPB anticipates adopting the rules in Spring 2006.

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2. ALTERNATIVES FOR ANALYSIS

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2.3 ALTERNATIVE COMPARISON	2-3

The State Environmental Protection Act (SEPA) requires that an Environmental Impact Statement (EIS) examine more than one alternative. This Draft EIS includes three alternatives: (1) the No Action Alternative; (2) the proposed action; and (3) the proposed action with some refinements of definitions of road construction and maintenance.

This chapter describes each of these alternatives and identifies one that was considered for detailed examination but was rejected.

2.1 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

One additional alternative was considered for analysis and submitted for public scoping. This alternative was based on the forest practices rules that existed before the adoption of the 2001 rules. Upon further analysis, it was recognized that implementation of this alternative is not be feasible because it would violate both Second Substitute House Bill (SSHB) 1095 and the Salmon Recovery Bill of 1999 (Engrossed Substitute House Bill 2091). In addition, a return to pre-Forests and Fish rules would entail greater environmental costs than the alternative defined by SSHB 1095. As such, the alternative did not meet the SEPA definition of “reasonable;” under SEPA, a reasonable alternative is a feasible alternative that meets the proposal’s objective at a lower environmental cost (SEPA Handbook, 1998).

2.2 ALTERNATIVES CONSIDERED IN DETAIL

The Washington forest practices rules (Title 222 WAC) apply to all public (except federal) and private forest lands. The proposed alternatives considered in detail in this EIS include the No Action Alternative (Alternative 1) and two action alternatives (2 and 3). Each of the alternatives presents different pathways to meeting the road maintenance and abandonment plan (RMAP) goals of the forest practices rules (see Figures 2-1 and 2-2). Under all three alternatives, the Washington Department of Natural Resources (DNR) can require any landowner to repair any forest road that is causing or has the potential to cause damage to a public resource. Most of the significant differences among the alternatives occur in the process by which the need for such repairs would be identified and addressed. For comparative purposes, the alternative pathways to the development of RMAPs and the repair of fish passage barriers are displayed graphically for each alternative in Figures 2-1 and 2-2.

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2.2.1 Alternative 1 (2001 Rules)

Alternative 1 represents the No Action Alternative. It entails continuing with the 2001 permanent forest practices rules and does not include the revisions to these rules produced by SSHB 1095. SEPA requires that the No Action Alternative in an EIS should be based only on permanent rules, not emergency rules. A summary of these rules as they apply to RMAP planning is provided below.

Under this alternative, all forest roads must be included in a DNR-approved RMAP by July 1, 2006 (see Appendix B for an example RMAP form, showing all requirements). These RMAPs would be required for all forest landowners regardless of ownership size, amount of timber harvest, or timing of submission of a forest practices application/ notification (FPA/N). Forest landowners with less than 500 acres of land (small forest landowners) would have to submit an RMAP for their ownership with their first FPA/N or by July 1, 2006, whichever comes first (see Figures 2-1 and 2-2). Those forest landowners with 500 acres or more of forest land (large forest landowners) would have until July 1, 2006 to include all their forest roads in an RMAP. They would submit the RMAPs at the rate of 20 percent of their roads or land base per year. The roadwork identified in the RMAP would be accomplished by 2016. RMAPs would include the removal of fish passage barriers (i.e., culverts, bridges), the reduction of road-related sediment, the reduction of potential mass wasting of roads, and the improvement of hydrologic connectivity. Roads would be prioritized for repair based on road assessments. Landowners would also submit standard road maintenance practices; pre-storm planning, emergency and post-storm inventory and restoration practices; an inventory of orphaned roads that pose risk to public safety and/or resources; and a detailed work plan.

2.2.2 Alternative 2 (Rules to Implement SSHB 1095)

Alternative 2 represents rules to implement SSHB 1095. These rules, presented in Appendix A, simplify RMAP planning requirements for small forest landowners, define “small forest landowner,” “forest road,” and “forest land” for small forest landowners’ RMAP planning purposes, and describe a cost-share program available to them to fix fish passage barriers.

Under Alternative 2, small forest landowners would complete a simplified RMAP (i.e., “Checklist RMAP,” Appendix C) that does not require professional forestry or engineering expertise. Small forest landowners would submit the Checklist RMAP when submitting an FPA/N for final or intermediate harvesting, or salvage of trees (see Figure 2-1). In contrast to Alternative 1 (which requires RMAPs to cover all roads on forest land that were constructed or used for forest practices after 1974), the checklist must include only those forest roads that are used for the FPA/N. Small forest landowners would be exempt from annual reporting of checklist accomplishments. Eighty/twenty landowners would not be required to submit an RMAP, Checklist or otherwise.

Under Alternative 2, there would be a cost-share program (i.e., the Family Forest Fish Passage Program [FFFPP]) for small forest landowners (see Figure 2-2). Under this program, fish passage barriers on small forest landowner properties would be prioritized for removal or repair on a worst first basis. The FFFPP would also provide for state financial and technical assistance for fixing fish passage barriers. Small forest landowners who enroll in this program would be relieved of any obligation to fix a fish passage barrier until the barrier is identified as a high priority. Also, an FPA/N could not be denied solely on the grounds that fish barriers have not been removed, provided the landowner has

agreed to participate in the FFFPP. The participating landowner would be able to conduct all otherwise permissible forest practices until the FFFPP cost-share program provides funding for the removal of barriers.

Finally, this rule package establishes a method for identifying small forest landowners using a harvest-based definition rather than an acreage-based definition. “Small forest landowner” would be partially defined as a landowner who harvests no greater than two million board feet (MMBF) of timber per year. The definition includes a hardship clause allowing a landowner to harvest more than two MMBF if DNR is satisfied that the harvest limits were exceeded to raise funds for estate taxes or other unexpected obligations. A “large forest landowner” would be any forest landowner who harvests more than two MMBF per year and would be required to meet the RMAP requirements in WAC 222-24-051.

Definitions of “forest road” and “forest land” as they relate to small forest landowners’ RMAP planning would also be revised. “Forest road” would exclude residential driveways and “forest land” would exclude agricultural croplands, pastures, and orchards, thereby granting exemptions from RMAP planning requirements in those areas.

2.2.3 Alternative 3 (Rules to Implement SSHB 1095 Plus Clarifications)

Alternative 3, the FPB’s Preferred Alternative, includes all of the provisions of Alternative 2, but with the following clarifications to the forest practices rule definitions of road construction and road maintenance.

“Road construction” would be defined as establishing any new road, or any roadwork (except for road maintenance) outside an existing forest road prism.

“Road maintenance” would be defined as (a) all roadwork located within an existing forest road prism, or (b) roadwork outside an existing forest road prism specifically relating to maintaining water control, road safety, or visibility. Examples of the maintenance activities that may occur outside an existing road prism would include maintaining, replacing, and installing drainage structures; controlling roadside vegetation; and abandoning forest roads according to the process outlined in WAC 222-24-052(3).

2.3 ALTERNATIVE COMPARISON

A detailed summary and comparison of the environmental effects of the three proposed alternatives considered in detail is displayed in Table 2-1. This table shows the major conclusions regarding the effects of the alternatives without the supporting rationales. The analyses and rationales supporting these conclusions are provided in Chapter 3, the Affected Environment (Section 3.1) and Environmental Effects (Section 3.2). For all resources, the environmental effects of Alternatives 2 and 3 were not expected to differ from each other; therefore, the two alternatives are addressed together. Alternative 1 served as the baseline against which the potential effects the other alternatives were compared.

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Table 2-1. Summary and Comparison of the Environmental Effects of the Proposed Alternatives

Criteria	Alternative 1 (No Action = 2001 Rules)	Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095, with clarifications)
Water Resources		
Road Surface Erosion and Road-related Landslides	Low risk that problem runoff sites would persist unidentified and unaddressed after 2016. Site evaluations would be completed by 2006 for all forest roads on each forest landowner's property.	Greater risk that problem runoff sites would persist unidentified and unaddressed after 2016. Site evaluations for most small forest landowners would be completed only when FPA/Ns are submitted, and only for roads used under the FPA/N. Checklist RMAPs may be prepared by landowners. Eighty/twenty landowners are exempt from RMAP requirements.
Water Quality (Sediment)	Low risk of ongoing sediment delivery to surface waters because RMAPs are required of all forest landowners by 2006.	Greater risk of ongoing sediment delivery to surface waters because some road problems may not be identified and fixed until Checklist RMAPs and FPA/Ns are submitted.
Riparian Areas		
Large Woody Debris, Leaf and Needle Litter Recruitment, Shade, and Microclimate Regulation	No change in ongoing effects from the presence of existing roads in riparian areas.	No change in ongoing effects from the presence of existing roads in riparian areas.
Riparian Disturbance, Sediment Control, and Stream Bank Stability	Low risk of road failures after 2016 on small forest landowner forest roads that could disturb riparian buffers that aid in sediment control to streams and stream bank stability, because RMAPs are required by small forest landowners by 2006.	Greater risk of failures on small forest landowner roads after 2016, because some road problems may not be identified and fixed until RMAPs and/or FPA/Ns are submitted. These failures could disturb riparian buffers that aid in sediment control to streams and stream bank stability.
Fish		
Hydrology	Low risk that road sections needing a closer spacing of ditch relief culverts might not be identified and corrected because RMAPs are required of all forest landowners by 2006.	Greater risk that road sections needing a closer spacing of ditch relief culverts might not be identified and corrected until small forest landowners submit FPA/Ns, which might not occur until after 2016, or perhaps not at all if forest landowners do not conduct harvest on their lands in the future.
Fine and Coarse Sediment	Low risk of ongoing sediment delivery to streams because RMAPs are required of all forest landowners by 2006.	Greater risk of ongoing sediment delivery to streams because some road problems may not be identified and fixed until Checklist RMAPs and FPA/Ns are submitted.
Large Woody Debris and Leaf and Needle Recruitment	No change in ongoing effects from the presence of existing roads in riparian areas.	No change in ongoing effects from the presence of existing roads in riparian areas.

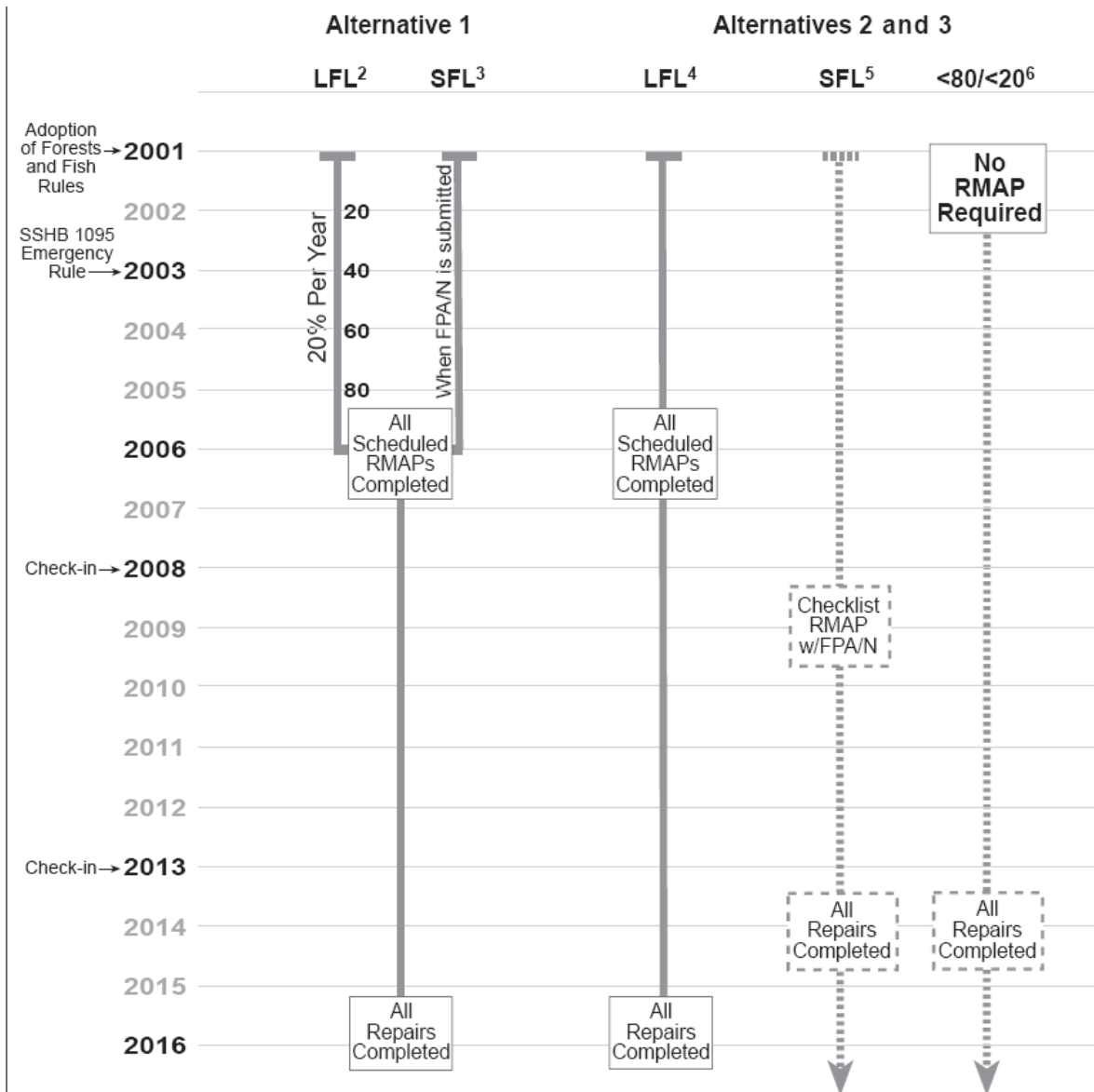
Table 2-1. Summary and Comparison of the Environmental Effects of the Proposed Alternatives (continued)

Criteria	Alternative 1 (No Action = 2001 Rules)	Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095, with clarifications)
Fish (continued)		
Floodplains and Off-channel Habitat	No change in ongoing effects from the presence of existing roads in riparian areas.	No change in ongoing effects from the presence of existing roads in riparian areas.
Water Quality (Temperature and Dissolved Oxygen)	No change in ongoing effects from the presence of existing roads in riparian areas.	No change in ongoing effects from the presence of existing roads in riparian areas.
Water Quality (Forest Chemicals)	Low risk of ongoing effects of forest chemicals to streams because RMAPs are required of all forest landowners by 2006.	Greater risk on small forest landowner lands of ongoing delivery of forest chemicals to streams because some road problems may not be identified and fixed until Checklist RMAPs and FPA/Ns are submitted.
Fish Passage	High certainty that fish passage barriers on small forest landowner properties would be fixed by 2016. However, small forest landowners may change their land management strategy (i.e., the timing or magnitude of timber harvest, land sales, or conversion) in order to finance fixing fish passage barriers.	Greater risk that some fish passage barriers on small forest landowner properties would not be fixed by 2016; some small forest landowners may not apply to the Family Forest Fish Passage Program (FFFPP), which could result in barriers not being identified or fixed until Checklist RMAPs and/or FPA/Ns are submitted, which could occur after 2016. The FFFPP provides greater certainty that fish passage barriers would be fixed on a worst first basis. Uncertainty exists in the funding sources and levels to be available to the FFFPP; however, check-ins with the legislature and state agencies during 2008 and 2013 increase the certainty that goals for fixing passage barriers will be met by 2016.
Wetlands		
Wetland Connectivity	No change in ongoing effects from the presence of existing roads in wetlands.	No change in ongoing effects from the presence of existing roads in wetlands.
Filling of Adjacent Wetlands	Low risk of ongoing sediment delivery to wetlands adjacent to eroding or failing roads because RMAPs are required by all forest landowners by 2006.	Greater risk on small forest landowner lands of ongoing delivery sediment delivery to wetlands because some road problems may not be identified and fixed until Checklist RMAPs and FPA/Ns are submitted.

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Table 2-1. Summary and Comparison of the Environmental Effects of the Proposed Alternatives (continued)

Criteria	Alternative 1 (No Action = 2001 Rules)	Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095, with clarifications)
Wetlands (continued)		
Hydrologic Functions	Low risk that road sections with inadequate drainage structures might not be identified and corrected because RMAPs are required of all forest landowners by 2006.	Greater risk on small forest landowner lands that road sections with inadequate drainage structures might not be identified and corrected until small forest landowners submit FPA/Ns, which might not occur until after 2016, or perhaps not at all if forest landowners do not harvest on their lands in the future.
Water Quality Functions	Low risk of ongoing sediment delivery to wetlands because RMAPs are required of all forest landowners by 2006.	Greater risk on small forest landowner lands of ongoing sediment delivery to wetlands because some road problems may not be identified and fixed until Checklist RMAPs and FPA/Ns are submitted.
Fish and Wildlife Habitat Functions	No change in ongoing effects from the presence of existing roads in wetlands. Low risk of further degradation to fish and wildlife habitat because RMAPs are required of all forest landowners by 2006.	No change in ongoing effects from the presence of existing roads in wetlands. Greater risk to small forest landowner lands of further degradation to fish and wildlife habitat because some road problems may not be identified and fixed until Checklist RMAPs and FPA/Ns are submitted.
Wildlife		
Habitat for Stream-Dwelling Amphibians	Low risk of habitat impacts from ongoing sediment delivery to streams because RMAPs are required of all forest landowners by 2006.	Greater risk to small forest landowner lands of habitat impacts from ongoing sediment delivery to streams because some road problems may not be identified and fixed until Checklist RMAPs and FPA/Ns are submitted.
Cumulative Effects		
	Low risk of cumulative adverse effects because RMAPs are required of all forest landowners by 2006.	Greater risk of cumulative adverse effects on water quality, riparian areas, fish resources, wetlands, and habitat quality for stream-dwelling amphibians due to runoff-related impacts to public surface waters from problem road segments. On land regulated by DNR, small forest landowner lands account for approximately 26 percent of the forest land acreage regulated by forest practices rules, and up to 20 percent of the fish passage barriers on forest land. Risk may be offset by progress evaluation check-in points in 2008 and 2013.



¹ Regardless of RMAP completion and timing, per WAC 222-24-052, landowners are required to construct and maintain roads in a manner that will prevent damage to public resources.

² Large Forest Landowners - those with 500 acres or more of forest land.

³ Small Forest Landowners - those with less than 500 acres of forest land.

⁴ Large Forest Landowners - those who do not meet the criteria that define Small Forest Landowners under Alternatives 2 and 3 (see following footnote).

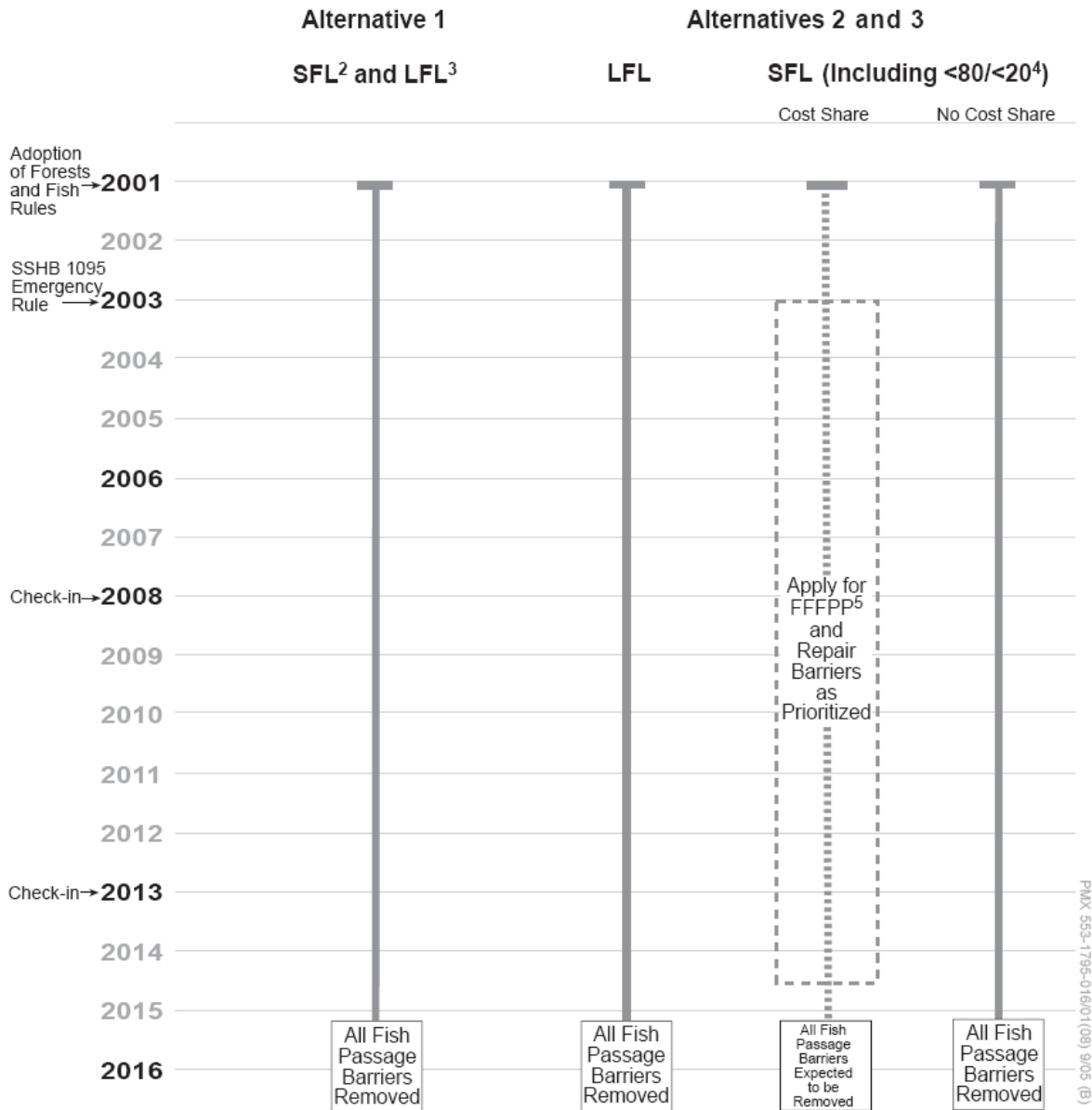
⁵ Small Forest Landowners - those who have not exceeded an average annual timber harvest level of two million board feet from their own forest lands in Washington State over the past three years, and will not exceed this level for the next ten years.

⁶ <80/<20: Landowners of 80 acres or less of forest land, harvesting contiguous blocks of 20 acres or less.

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Figure 2-1. Alternative Pathways to Development of RMAPs for Various Landowner Classes Defined under the Proposed Alternatives

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¹ Regardless of RMAP completion and timing, per WAC 222-24-052, landowners are required to maintain roads in a manner that will prevent damage to public resources.

² Small Forest Landowners - those who have not exceeded an average annual timber harvest level of two million board feet from their own forest lands in Washington State over the past three years, and will not exceed this level for the next ten years.

³ Large Forest Landowners - those who do not meet the criteria that define Small Forest Landowners under Alternatives 2 and 3 (see preceding footnote).

⁴ <80/<20: Landowners of 80 acres or less of forest land, harvesting contiguous blocks of 20 acres or less.

⁵ The Family Forest Fish Passage Program (FFPP) is a voluntary cost-share program that provides financial and technical assistance to SFLs who enroll. SFLs who do not participate in the FFPP are required to remove all fish passage barriers on their forest roads by 2016, with no assistance from the FFPP.

Figure 2-2. Alternative Pathways to Repairing Fish Passage Barriers for Various Landowner Classes Defined under the Proposed Alternatives

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

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3.1.1 Available Data	3-2
3.1.2 Analysis Approach.....	3-3

3.1 INTRODUCTION

This chapter describes the affected environment and environmental effects of the proposed alternatives for road maintenance and abandonment plan (RMAP) planning requirements for small forest landowners. “Forest landowner” is defined in RCW 76.09.020 and includes state, local government, and private forest land. The proposals apply to the RMAP planning requirements for small forest landowners as defined in RCW 76.09.050.

As a subset of the lands covered by the Forest Practices Rules Environmental Impact Statement (Forest Practices Rules EIS) (Washington Forest Practices Board [FPB], 2001) and Forest Practices Rules Habitat Conservation Plan (Forest Practices Rules HCP) Draft EIS prepared by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) in 2005, the Affected Environment sections of this EIS describe the current condition of the forest lands that are governed by forest practices rules. Discussions of the affected environment refer to and build on information presented in those EISs, but focus more specifically on conditions related to small forest landowner properties (where possible) as well as RMAP planning rules against which the alternatives are evaluated.

The resource areas that may be adversely affected by the proposed alternatives are discussed as follows:

- **Water Resources**, including hydrology water quality (Section 3.2)
- **Riparian Areas** (Section 3.3)
- **Wetlands** (Section 3.4)
- **Fish** (Section 3.5)
- **Wildlife** (Section 3.6)

The direct and indirect environmental effects related to each of the above resource areas are discussed after the presentation of the affected environment. Cumulative effects for each resource area are addressed in a separate section at the end of Chapter 3. The resource area sections are organized in a manner that allows for subsequent sections to refer to and build upon previous sections.

Environmental impacts are disclosed, including the direct, indirect, and cumulative effects. Direct environmental effects are those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or are spatially removed from the activity but would be considered significant in the foreseeable future. Cumulative effects result from the incremental effects of actions when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such

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other actions. The environmental effects sections provide the scientific and analytical basis for the comparison of alternatives presented in Chapter 2 (Table 2-1).

The analysis of alternatives in this EIS refers to and builds upon the analysis of Alternative 2, the selected alternative, presented in the Forest Practices Rules EIS (Washington FPB, 2001). Alternative 1 of this EIS represents Alternative 2 of the Forest Practices Rules EIS (Washington FPB, 2001). The temporal scale of this analysis is the same as the Forest Practices Rules EIS and will address the short term (10 years) and long term (50 years). In contrast to the Forest Practices Rules EIS, however, this EIS focuses on the analysis of the RMAP planning component of the Forest Practices Rules EIS Alternative 2. Specifically, this EIS focuses on proposed RMAP rule changes for small forest landowners.

In addition to the Draft and Final Forest Practices Rules EIS (Washington FPB, 2001), the Draft Forest Practices Rules HCP EIS (NMFS and USFWS, 2005) is frequently referenced in this EIS. Both of these EISs may be found in public libraries throughout the State of Washington, including the Washington State Library, depository libraries, university and college libraries, as well as county and city libraries. They may also be found on the Washington Department of Natural Resources (DNR) website (dnr.wa.gov/forestpractices/rules and dnr.wa.gov/htdocs/agency/federalassurances). Most of the resource area sections in this EIS refer to information presented in the affected environment sections of these EISs. However, some information has been updated and is focused on the small forest landowner properties.

3.1.1 Available Data

Upon initiation of the RMAP EIS project, the project team met to discuss available geographic information system (GIS) databases that could be used to support the analysis of alternatives for this EIS. Several main GIS database sources were identified:

- University of Washington's Rural Technology Initiative (RTI) small forest landowners database
- Washington Department of Fish and Wildlife's (WDFW) fish barrier database
- DNR Forest Practices Division's wetlands database (based on the National Wetlands Inventory [NWI; USFWS, 1999])
- DNR transportation, hydrography, landslide, and slope stability databases

These GIS databases, and how they were used, are described further in Appendix C. Each database was reviewed and attempts were made to organize and analyze the information in ways that would (1) further describe the affected environment and (2) facilitate comparison of the potential environmental effects of the proposed alternatives.

The RTI is developing its small forest landowner database on a county-by-county basis as funding from various sources is made available. The database currently contains information for five counties: Clark, Cowlitz, Lewis, Thurston, and Okanogan. For this analysis, however, the Clark County data were not used because the timber acreage values were found to be incorrect due to a data processing error. This database provided some sense of the magnitude of change (relative to total acres of forest land) in the acres of land that may be affected by the proposed RMAP requirements and thus some sense of the magnitude of effects statewide.

The WDFW database provided site-specific locations and information about fish passage barriers. However, this database is also a work in progress, and as such the amount of area sampled was not available to estimate the density of fish passage barriers in each county

(or sample area) at this time. The wetlands and slope stability databases provided a general sense of where wetlands and high-hazard slopes are situated with respect to the roads and small forest landowner properties in the four RTI sample counties.

3.1.2 Analysis Approach

This is a “non-project” proposal; therefore, the EIS is programmatic. Consequently, the analysis of each resource area focuses specifically on evaluating the impacts of forest practices rules that are being proposed for modification under the alternatives. Conclusions are based on reasonably available data and are generally based on qualitative analyses, supported by quantitative data that was readily available and appropriate. The analysis of the proposed alternatives implicitly considers the potential for meeting the three environmental goals of the Forests and Fish Report and the 2001 rules:

- Provide compliance with the ESA for aquatic and riparian-dependent species.
- Restore and maintain riparian habitat to support a harvestable supply of fish
- Meet the requirements of the Clean Water Act (CWA) for water quality.

A fourth goal of the Forests and Fish Report and the 2001 rules is to keep the timber industry economically viable in the State of Washington. This goal as it pertains to the proposal is addressed in the Economic Analysis (see 1.3.3 Other Issues and Related Documents).

This EIS considers only how each element of the alternatives would meet the three environmental goals. However, the question of whether each element would meet the environmental goals cannot be definitively answered with a yes or no. The economic goal is addressed in the RMAP economic analysis (Krug, 2005).

As mentioned in the Forest Practices Rules EIS (Washington FPB, 2001), there is incomplete knowledge about the relationships between aquatic and riparian systems. The ecology and management of aquatic and riparian habitats within forest ecosystems are a complex and developing science. Therefore, the major conclusions of this EIS relative to meeting the environmental goals of the FPB are necessarily expressed in terms of risk. Ideally, risk statements should be quantified. However, because the physical and biological relationships of aquatic and riparian systems are imprecisely defined, and because quantitative measures do not exist for many aspects of the alternatives, the risk statements are given in qualitative terms.

Risk is defined in this EIS as the likelihood that a specific factor will not support the achievement of one or more of the environmental goals. These risk statements assume that other factors (e.g., non-forest practices, ocean conditions, harvest, etc.) do not prevent the goals from being met.

The scientists who conducted the analysis for this EIS developed risk statements based on best professional judgment after weighing all of the evaluation criteria that were developed, as well as their review of the scientific literature. They also considered the performance targets identified in Schedule L1 of the Forests and Fish Report and the likelihood that they would be achieved. Alternative 1 served as the baseline against which the potential effects of the other alternatives were compared.

Notably, the alternatives analyzed in this EIS pertain only to the RMAP planning process and the timing of removal of fish passage barriers on small forest landowner properties. The overall goals of each alternative are the same; however, the pathway proposed to

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achieve these goals varies among alternatives (see Figures 2-1 and 2-2). The timing and level of reporting road problems, as well as the funding source for and prioritization of resolving fish passage barriers, are the primary factors that vary among alternatives.

Under Alternatives 2 and 3, small forest landowners are defined based on annual harvest levels (average of 2 million board feet [MMBF]). Most small forest landowners do not maintain a specific harvest schedule for their forest lands; therefore, the locations of roads that would be subject to RMAP planning requirements cannot be predicted. Under the harvest-based definition, larger blocks of single-owner forest lands may qualify as small forest landowners as long as the historic and future harvest limits specified in the rule are met. Consequently, future conditions cannot be predicted with an adequate level of confidence to support detailed quantitative evaluations. To estimate the extent of area potentially affected by the proposed RMAP requirements, those parcels with forest land totaling 5,000 acres or less were used as a surrogate for those landowners that may harvest up to two MMBF and thus qualify as a small forest landowner for the associated RMAP requirements and Family Forest Fish Passage Program (FFFPP). The different definitions of small forest landowners under Alternative 1 *versus* Alternatives 2 and 3 were not found to result in any meaningful differences in environmental effects. All landowners, large and small, would be required to complete RMAPs by July 1, 2006, under Alternative 1; therefore, for this analysis the distinction between small and large forest landowners under Alternative 1 was determined to be moot.

For this analysis, the RTI small forest landowner data serve as an index to the direction and relative magnitude of change in acres of land or miles of road that may be affected among the alternatives. This estimate is intended to give a general sense of the areal extent within which effects may occur, rather than to quantify environmental impacts. It is important to note that a statewide analysis of small forest landowner ownership has not been conducted; therefore, estimates of small forest landowner ownership are available only for the four sample counties. The proportion of private forest land properties as a percentage of total land area in each county provides an indication of the minimum proportion of land area that may be affected. Due to the wide range of conditions in counties throughout the state, however, county-specific values cannot be meaningfully extrapolated statewide.

It should be noted that the RTI database does not distinguish among public landowners (e.g., federal, state, county, municipal). RTI created their data specifically to locate small forest landowners and identify where fish passage barriers overlap these lands within each county. To avoid errors that would result from including federal lands with small forest landowner properties, discussions of RTI data focus only on private, non-industrial landowners (defined as individual ownerships smaller than 5,000 acres and not directly associated with wood processing or handling facilities). As such, values based on RTI data do not include lands managed by public entities and thus do not reflect the total area of small forest landowners. As discussed above, conclusions in this chapter are based on qualitative analyses, and quantitative data are presented as an indicator of the relative magnitude of the differences among the alternatives.

Within the four sample counties, the proportion of private forest lands ranges from 6 to 61 percent of the total land area, with a four-county average of 25 percent (Table 3.1-1). Industrial forest landowners (individual ownerships greater than 5,000 acres and directly associated with wood processing or handling facilities, and therefore who would be required to prepare an RMAP under all alternatives) manage between 12 percent (Okanogan County) and 85 percent (Cowlitz County) of the private forest land base in the sample counties, with a four-county average of 65 percent.

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Table 3.1-1. Acreage of the Four Sample Counties on which RMAPs, Checklist RMAPs, or No RMAPs Would Be Required for Private Forest Landowners, under Each Alternative

County (total land area ^{1/})	Acres of Private Forest Land		Percent of Total Land Area	
	Alt 1	Alts 2 and 3	Alt 1	Alts 2 and 3
Cowlitz (728,732 acres)				
RMAP ^{2/}	446,470	378,045	61%	52%
Checklist RMAP ^{3/}	0	51,069	0%	7%
No RMAP ^{4/}	0	17,356	0%	2%
Lewis (1,540,888 acres)				
RMAP	665,604	502,279	43%	33%
Checklist RMAP	0	138,244	0%	9%
No RMAP	0	25,081	0%	2%
Thurston (465,294 acres)				
RMAP	207,446	77,217	45%	17%
Checklist RMAP	0	96,117	0%	21%
No RMAP	0	34,112	0%	7%
Okanogan (3,371,562 acres)				
RMAP	188,968	22,859	6%	1%
Checklist RMAP	0	140,941	0%	4%
No RMAP	0	25,168	0%	1%
Four-County Total (6,508,538 acres)				
RMAP	1,508,488	980,400	25%	16%
Checklist RMAP	0	426,371	0%	7%
No RMAP	0	101,717	0%	2%

Sources: RTI 2005 (forest land), Washington Office of Financial Management 2005 (total land area).

- 1/ Total land area includes dry land and land temporarily or partially covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, and canals less than 200 feet wide; and lakes, reservoirs, and ponds less than 4.5 acres in area.
- 2/ RMAPs would be required for all forest landowners under Alternative 1, and large forest landowners under Alternatives 2 and 3. For this analysis, forest landowners include industrial landowners, small forest landowners, and possible small forest landowners, as identified by RTI
- 3/ Checklist RMAPs would be required for small forest landowners under Alternatives 2 and 3
- 4/ RMAPs would not be required for 80/20 landowners under Alternatives 2 and 3.

Thus, approximately one-third of the private forest land base in the RTI data set is small forest landowner properties, and would be affected by changes to RMAP planning rules under Alternatives 2 and 3. The greater part of these small forest landowners (28 percent of the private forest land base in the four sample counties) would be required to complete Checklist RMAPs; 7 percent of the private forest land base in the four sample counties is managed by 80/20 landowners, who would not be required to complete Checklist RMAPs under Alternatives 2 and 3.

Several key assumptions related to forest practices rules and other programs to some degree influence the analysis of the alternatives.

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- (1) Regardless of the proposed RMAP requirements for small forest landowners addressed in this EIS, WAC 222-24-052 requires that forest roads be maintained in a manner that will prevent potential or actual damage to public resources. Under WAC 222-024-052, DNR may require a forest landowner to fix road problems. Environmental effects related to anticipated delays in road repairs due to the proposed changes in RMAP planning requirements would be mitigated by this requirement that applies to all forest landowners.
- (2) More stringent reporting and planning requirements under the 2001 rules would be expected to result in more timely identification and resolution of road-related problems, which in turn would reduce the risk of road-related resource damage. Requiring landowners to provide DNR with complete reports of road conditions as well as descriptions of plans to resolve problems would likely increase the chance that such efforts would succeed in minimizing or eliminating adverse environmental impacts associated with roads. The converse is also assumed to be true. That is, reduced opportunities for DNR oversight and enforcement would be expected to lead to an elevated risk of adverse environmental impacts from problem areas that have not been detected or addressed. If a forest landowner is not required to conduct a complete inventory of roads and report all problems, there is a greater risk that problems will not be repaired. This is because some road problems may not be identified or addressed by some small forest landowners under this less stringent process.
- (3) As a consequence of the rule changes mandated by SSHB 1095, DNR has an increased responsibility to gather information about road segments that may be causing resource damage. This increased responsibility occurs in two ways. First, Checklist RMAPs completed by small forest landowners are required to address only those road segments and fish passage barriers that are included in a forest practices application/notification (FPA/N). It is up to DNR to ensure that road segments not associated with FPA/Ns have no problems. Second, Checklist RMAPs provide no opportunity for DNR to review planned repairs before they occur. Therefore, DNR has an increased responsibility to investigate and identify road-related problems on small forest landowners' properties and work with individual landowners to ensure the problems are fixed.
- (4) Adaptive management effectiveness monitoring applies to all alternatives. Adaptive management allows for identification of problems and change in the rules over the long term, based on feedback from research and monitoring activities.
- (5) The alternative rules considered in this EIS would not be expected to change small forest landowner rates of forest road abandonment. Many factors influence a landowner's decision to abandon a road, including future expected use, value of the road for access to lands, costs associated with abandoning a road, and costs associated with maintaining a road.
- (6) Adequate funding for the FFFPP is assumed to be available for the life of that program.

Finally, the issue of uncertainty was also considered. Because of the lack of information available to make definitive statements regarding risk, each of the risk statements given has some amount of uncertainty associated with it. In a few cases, the amount of uncertainty associated with the risk statement is quite high; in these cases, the high uncertainty is noted as part of the risk statement.

3.2 WATER RESOURCES

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3.2.1 Introduction

This section describes the hydrology and related sediment yield and water quality processes that influence road-related impacts to streams and wetlands. Current conditions and road management activities that could occur on small forest landowner parcels and the likely effects of the alternatives on the condition of public resources are presented.

Surface erosion and landslides associated with forest roads are closely linked to hydrology. Changes in surface runoff can result in increased delivery of sediment to surface waters, as well as changes to channel condition and water quality. The primary ways that roads can influence hydrology are (1) changed interception and storage of precipitation within the road prism area; (2) changed interception of natural surface and shallow groundwater runoff; (3) concentration of runoff and transfer from one portion of a slope or drainage to another, via ditches; and (4) changed frequency, magnitude, and duration of runoff related to ground disturbance and vegetation removal within the road prism.

General forest practices policy is to protect stream functions through rules for timber harvest, road construction, and road maintenance. A well-designed, -located, -constructed, and -maintained system of forest roads is essential to forest management and protection of public resources (WAC 222-24-010(1)). To protect water quality and riparian habitat, roads must be constructed and maintained in a manner that prevents potential or actual damage to public resources (WAC 222-24-010(2)). Forest practices rules are co-promulgated with the Department of Ecology to ensure compliance with state water quality standards, which are motivated in part by the CWA. Forest practices rules are intended to protect surface and groundwater conditions and provide for adequate protection of water quality for fish and wildlife.

Findings from watershed analysis have demonstrated that problem areas on many forest roads delivered sediment to surface waters, potentially impacting water quality and aquatic habitat conditions. To provide a practical and effective approach to road impacts on water quality, the mandatory RMAP process was established by the 2001 rules to identify problems that affect public resources, upgrade roads, and annually monitor and report on road conditions with the purpose of minimizing impacts to public resources.

3.2.2 Affected Environment

This section describes the effects of forest roads on forest hydrology and water quality, as well as the current conditions of water resources on small forest landowner properties in Washington.

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3.2.2.1 Hydrology

Forest roads influence runoff by changing the way that precipitation flows from the land surface (Dunne and Leopold, 1978; Helvey, 1980; Bosch and Hewlett, 1982; Harr, 1983; Kattlemann et al., 1983; Troendle, 1983; King and Tennyson, 1984; Trimble and Weirich, 1987; Keppeler and Ziemer, 1990; Montgomery, 1994; Washington FPB, 2001). Roads, landings, skid trails, and harvest units form areas with increased runoff through loss of vegetation cover or compaction. Shallow groundwater and runoff from bare fill slopes, cut slopes, and especially road surfaces are concentrated by roads in ruts, ditches, drainage structures, and culverts. The increased and concentrated runoff can cause surface erosion along the road surface, in ditches, and where water flows off the road. Increased runoff can cause landslides if it is directed onto steep slopes, or can cause channel changes and reduced water quality if it enters surface waters. Landslides, increased surface erosion, and delivery of fine and coarse sediment to streams and wetlands can also be caused by problems (for example, undersized culverts) with poorly built and unmaintained roads.

Increased runoff from harvest areas is often intercepted by roads and directed by drainage structures. If drainage structures are not properly designed and maintained, runoff can enter streams and wetlands. Changes in the water yield, base flows, and peak flows are related to the proportion of the upstream watershed forest that has been cut and the amount and layout of roads and road drainage. The risk of increased peak flows, mass wasting, and surface runoff is typically not found along entire road networks, but rather is often localized to specific road segments during wet periods.

Western Washington has moderate to high amounts of precipitation that typically falls as rain at lower elevations, snow at higher elevations, and a mix in the middle elevation zones. Rainfall combined with snowmelt can cause some of the largest runoff periods, known as rain-on-snow floods. Such floods can occur more frequently in younger forests in the middle elevation zones. In eastern Washington, runoff is usually caused by winter snow pack melt and by local thunderstorms during the spring or summer. Large rain-on-snow floods are less frequent on the east side.

The main influences of the construction, use, and maintenance of forest roads on hydrology were summarized in the Forest Practices Rules EIS (Washington FPB, 2001) and include the following:

- Increased fine sediment inputs to streams due to surface runoff intercepted by and directed from roads
- Increased coarse sediment inputs to streams from increased surface runoff and associated road-related mass wasting
- Increased peak flows at the sub-basin scale from the expanded drainage network and interception by road cuts of increased subsurface flow

3.2.2.2 Water Quality

Aspects of water quality most influenced by forest practices include temperature, sediment, dissolved oxygen, and chemicals applied as fertilizer and to control pests and vegetation. Road impacts to stream temperatures, dissolved oxygen, and nutrients are discussed in Section 3.3 Riparian Areas. The main potential water quality impacts from forest roads relate to changes in sediment yield and delivery to surface waters; the other water quality factors would not be expected to be significantly influenced by the rules under evaluation in this EIS. The sediment-related water quality standards for Class A (Good) and Class AA (Excellent) waters in Washington State are the same (Table 3.2-1).

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Table 3.2-1. Washington State Water Quality Standards for Sediment-related Parameters

Water Quality Parameter	Washington State Standard (Class AA, Excellent)	Washington State Standard (Class A, Good)
Sediment	In regard to forest practices, implementation of approved BMP will meet narrative water quality criteria such as support characteristic water uses, aesthetic values, etc.	Same as Class AA
Turbidity	Shall not exceed 5 NTU ¹ over background when the background level is 50 NTU or less, nor increase more than 10% of background when background level is 50 NTU or more.	Same as Class AA
All Parameters	Whenever waters are of a higher quality than the assigned criteria, actions reducing water quality shall not be allowed except as described in WAC 173-201A-070 (1997).	Same as Class AA

Source: chapter 173-201A WAC

¹ Nephelometric turbidity units (NTU) are the measurement units of turbidity using a nephelometer (light reflected by particles in suspension at a right angle to the original source).

Sediment effects on water quality related to road use, maintenance, and abandonment are all important factors in the production and delivery of sediment to streams and wetlands in Washington State. Surface erosion from roads tends to be a chronic source of fine sediment to the drainage network that can adversely impact the physical habitat of the aquatic system and degrade water quality for other water uses.

Two main sediment parameters, suspended sediment and turbidity, are both related in part to sediment delivery and transport from roads. Streams that exceed water quality standards (see Table 3.2-1) for sediment often have high suspended sediment delivery rates and related higher turbidity. Effects of increased turbidity can include a decrease in primary productivity of algae and periphyton from the decrease in light penetration, which can adversely affect productivity of macroinvertebrates and fish (Gregory et al., 1987).

Increased fine sediment and turbidity can also affect fish adversely (Iwamoto et al., 1978; see Section 3.5 Fish). Deposited fine and coarse sediment delivered from roads by surface erosion and mass wasting can impact fish spawning and incubation (Spence et al., 1996). Delayed, reduced, or eliminated inspection and planning of existing roads increase the risk that road erosion or drainage problems will not be identified or corrected, thereby increasing the risk of negative impacts to water quality and aquatic habitat conditions. The Draft Forest Practices Rules HCP EIS (NMFS and USFWS, 2005) provides a summary of currently available information on sedimentation impacts by regions of the state.

Road-related surface erosion is affected by the road use level, road surface material, maintenance level, the intensity and amount of precipitation, and other factors (Megahan and Kidd, 1972; Reid and Dunne, 1984). Forest roads are known to be significant areas of sediment erosion (Megahan and Kidd, 1972; Cederholm and Reid, 1987; Chamberlin et al., 1991; Harr and Nichols, 1993; Best et al., 1995; Nolan and Janda, 1995). The number, size, and frequency of landslides are increased by slope disturbance associated with roads. Road-related slides — especially those near streams or on steep slopes above them — can increase in size via landslide scar erosion and continue to deliver coarse and fine sediment over many years.

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Forest roads require regular monitoring and maintenance to minimize erosion and potential delivery of sediment to streams or wetlands. Timely identification of potential problem sites can reduce or prevent resource impacts associated with road-related erosion or landslides. Surface erosion and various types of landslides from existing roads can be reduced by identifying problem areas and responding with maintenance, best management practices (BMPs), repairs, and, in some cases, abandonment.

One of the first principles of reducing road-related landslide and erosion problems is proper location of the road and drainage system. Many standard BMPs are designed to prevent problems associated with road location. For example, avoiding landslide hazard areas and locations where erosion runoff cannot be dispersed to the forest floor is now accepted as a primary BMP for new roads. Many existing roads were built using historic road construction approaches that did not consider these standards, and many existing problem sites require upgrades, frequent maintenance, and, in some cases, abandonment. Identifying and prescribing practical and effective solutions to the problem sites on the present road networks takes experienced forest hydrologists, geomorphologists, and forest road engineers familiar with the region.

The first step to reducing impacts to streams and wetlands is an inventory of problem sites, followed by an action plan and gradual upgrades and monitoring using the action plan. Forest roads require regular monitoring and maintenance of drainage structures to minimize landslides, erosion, and water quality impacts. Road surfaces, water bars, drivable grade dips, ditches, road drainage structures, stream culverts and bridges, and other road features all need regular inspection and maintenance to minimize the risk of landslides and surface erosion. Consistent maintenance, as required by forest practices rules and conducted by forest landowners, reduces the risk of road failure or ongoing surface erosion. Without monitoring and effective maintenance, forest road drainage features may fail during wet periods. Failure of such features allows water to flow down the roads to sites that can deliver sediment directly to streams and/or wetlands. Inspections before the wet season and during and following storms have been shown to help reduce erosion and drainage problems from forest roads.

3.2.2.3 Current Conditions

The only GIS database available for this analysis of road impacts is the small forest landowner parcel database created by the RTI (2005) for three westside counties (Cowlitz, Lewis, and Thurston) and one (Okanogan) on the east side. The county-based small forest landowner data were combined with DNR road data (Washington DNR, 2005b) and slope instability data (Shaw and Vaugeois, 1999) to provide estimates of area and miles of road within the sampled counties. Road data were available for all four counties, but slope instability data were available only for the three westside counties. Although not randomly chosen (as were the sub-sample sections for the Forest Practices Rules EIS [Washington FPB, 2001]), these selected counties provide the most up-to-date and spatially complete information presently available to estimate existing conditions for small forest landowner properties.

For this analysis, GIS data on roads include surfaces of crushed rock, gravel, native material, and unknown. Road class includes light duty, unimproved, and unknown. The road data were originally based on USGS 1:24,000 scale topographic maps compiled from 1994-1996 with some specific sites subsequently added. The data have not been verified and likely under-represent existing transportation routes.

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Hydrology, sediment erosion, and water quality risks to streams and wetlands increase with increasing road mileage. This is especially true in areas with a higher probability of slope instability. A minimum of approximately 12,201 miles of forest roads occurs on privately owned forest lands in the four sample counties (Table 3.2-2). Notably, these road data do not include the other 23 Washington State counties with significant forest lands, and the data likely underestimate the occurrence of small roads and landing areas.

Table 3.2-2. Miles of Road on Private Parcels for which RMAPs, Checklist RMAPs, or No RMAPs Would Be Required in the Four Sample Counties under Each Alternative

County	Alternative 1	Alternatives 2 and 3		
	RMAP	RMAP	Checklist RMAP	No RMAP
Cowlitz	4,457	4,002	345	110
Lewis	5,243	4,503	638	102
Thurston	1,389	751	484	154
Okanogan	1,112	265	659	188
Total	12,201	9,521	2,126	554

Source: Washington DNR 2005b

Estimates of the area with low, moderate, and high probability of slope instability for shallow landslides in western Washington were obtained from Washington DNR (2005a) (Table 3.2-3). The shallow landslide hazard model SLPSTAB (Montgomery and Dietrich, 1994) used in this analysis is based on estimates of many of the most common slope factors and has been used in Washington forest management before. The model has been tested with good results by Montgomery and Dietrich (1994) and Shaw and Vaugeois (1999). Data were available only for the three westside counties (Cowlitz, Lewis, and Thurston). The more lands there are with a high or moderate probability of slope instability, the more likely there are existing roads in problem areas and the greater the need for timely inspections, use of BMPs, and frequent monitoring and maintenance.

On all privately owned forest lands in the three westside sample counties, approximately 22 percent of the land base has a moderate (243,538 acres) to high (80,161 acres) probability of slope instability (Table 3.2-3). This indicates a need for the RMAP process on nearly one-quarter of westside privately owned forest lands, given that forest roads were typically built to access forested areas.

Road density provides an index of the risk of road-related surface erosion and mass wasting. The more roads there are per unit area of forest land, the greater the risk of erosion and delivery of sediment to surface waters. For this analysis, road density values were calculated from the values in Tables 3.2-2 and 3.2-3. Road densities on all private forest lands in the three inventoried westside counties range from 3.6 to 5.7 miles per square mile, with an average of 4.8 miles per square mile. Road densities on small forest landowner properties required to complete Checklist RMAPs range between 2.7 and 4.0 miles per square mile, with an average of 3.1 miles per square mile. On 80/20 landowner parcels, where no RMAPs would be required under Alternatives 2 and 3, road densities varied between 2.3 and 3.8 miles per square mile, with an average of 2.6 miles per square mile. These values are similar to the range of average road densities estimated statewide in the Draft Forest Practices Rules HCP EIS (NMFS and USFWS, 2005; Table

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D.2). Road densities presented in that document varied regionally between 2.5 and 4.6 miles per square mile, with an overall average road density of 3.4 miles per square mile. This indicates the four RTI sample counties probably have similar existing road conditions and provide a rough estimate of average road conditions statewide. The average road density on the industrial forest landowner properties (defined in Section 3.1, above, i.e., where RMAPs would be required under all alternatives) is notably higher than that on the small forest landowner properties.

3.2.3 Environmental Effects

3.2.3.1 Evaluation Criteria

The following describes the criteria used to evaluate the adverse effects of the proposed alternatives on water resources.

Accelerated rates of erosion can cause increased sediment delivery to channel networks, where it can affect water quality, channel conditions, and aquatic resources. Increased sediment delivery to streams can reduce the quantity and quality of habitat for aquatic organisms such as fish, amphibians, and macro-invertebrates (Bisson et al., 1987).

Forest roads increase sediment erosion and mass wasting that can deliver fine and coarse sediment to surface waters. Fine and coarse sediment can impair municipal and agricultural use of water, affect bed material size, and alter the quantity and quality of habitat for fish and benthic invertebrates (Washington FPB, 2001). Reduction of single-event and chronic erosion sources by use of BMPs on existing roads has been shown to reduce sediment yield and delivery and improve water quality conditions. Similarly, road inspection, maintenance, and abandonment can minimize the risk of adverse impacts to water quality.

For this analysis, the relative risk of sediment erosion and delivery from roads is compared among the alternatives. The comparison is based on the relative level of oversight and difference in timing of the RMAP process for forest landowners. To help illustrate the relative risk of maintenance-related impacts, RTI data from the four sampled counties are used to compare differences in the number of road miles for different landowner types.

The landowner types are defined by the planning requirements under Alternatives 2 and 3, based on whether an RMAP, a Checklist RMAP, or no RMAP would be required. Changes to the forest practices rule definitions of road construction and maintenance under Alternatives 2 and 3 are not expected to result in different impacts to water resources. Consequently, the effects of both alternatives are addressed together for comparison to Alternative 1.

Table 3.2-3. Areas (Acres) of Low-, Medium-, and High-probability of Slope Instability on Private Parcels for which RMAPs, Checklist RMAPs, or No RMAPs Would Be Required in the Three Westside Sample Counties under Each Alternative

County	Alternative 1			Alternatives 2 and 3								
	RMAP			RMAP			Checklist RMAP			No RMAP		
	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Cowlitz	378,726	99,167	18,772	319,849	87,646	15,302	43,492	8,626	3,102	15,385	2,895	368
Lewis	554,690	123,004	55,851	408,577	110,855	49,450	120,575	10,669	5,487	25,538	1,480	914
Thurston	217,296	21,367	5,538	69,950	14,959	2,978	106,578	5,163	1,938	40,768	1,245	622
Total	1,150,712	243,538	80,161	798,376	213,460	67,730	270,645	24,458	10,527	81,691	5,620	1,904

Sources: Montgomery and Dietrich (1994) slope stability model; small forest landowner Lands, RTI (2005).

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3.2.3.2 Comparison of Alternatives

Alternative 1 (2001 Rules)

The 2001 rules included a change in the definition of fish from anadromous to all fish (including resident), thus requiring larger culverts in non-anadromous fish streams, adding minimum sizes for relief culverts, and requiring culverts in all streams to be large enough to accommodate the 100-year rather than the 50-year flood magnitude. Another change was in the requirement for RMAPs. Prior to 2001, DNR had the discretion to require an RMAP only for roads the DNR determined had the potential to damage public resources. In 2001, the rule required all forest landowners to submit an RMAP for all their forest roads. Forest landowners were given five years (i.e., until 2006) to complete the RMAP and 15 years (i.e., until 2016) to complete necessary roadwork.

The 2006 deadline for all landowners (large and small) to develop RMAPs would likely result in the timely identification and resolution of more runoff problem sites than under Alternatives 2 and 3. High-priority runoff sites would be identified in the near term instead of over many decades as FPA/Ns are submitted. Site evaluations would be more rigorous than the simplified Checklist RMAP proposed in Alternatives 2 and 3 and would likely be conducted by more experienced persons with training in road drainage and erosion issues.

Improvements would be expected to occur on many thousands of miles of forest roads statewide over a 15-year period instead of over multiple decades. For the three western Washington counties, these gradual improvements in runoff would occur on a minimum of about 11,089 miles of privately owned forest roads, and for the one inventoried eastern Washington county on a minimum of about 1,112 miles of privately owned forest roads (Table 3.2-2). Note that these data do not include public lands where RMAP requirements would apply.

Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095 with Clarifications)

Under Alternatives 2 and 3, small forest landowners would be required to prepare a Checklist RMAP at the time of submitting an FPA/N for timber harvest (includes salvage). Checklist RMAPs would cover only those roads used under the FPA/N and would not have to cover other roads on the small forest landowner property. Also, 80/20 landowners would not be required to submit a Checklist RMAP. Under Alternatives 2 and 3, DNR would retain its authority to require landowners to repair any forest roads that cause or have the potential to cause damage to a public resource. Identification of such problems on small forest landowner lands could be delayed, however, because no formal review of road conditions (i.e., an RMAP) would be required from the landowner until an FPA/N is submitted.

Under Alternatives 2 and 3, fewer small forest landowner runoff-related problem sites would be identified in a timely manner compared to Alternative 1. Past experience with other review and permit processes, including erosion and drainage control planning, indicates review, inspection, and enforcement are often needed to achieve on-the-ground improvements that overcome a century of old methods and poor construction habits. It is possible that drainage structures on some small forest landowners' forest roads would not be fixed as soon under Alternatives 2 and 3 as they would be under Alternative 1. This could result in a greater risk of runoff-related impacts from small forest landowner roads on streams, riparian zones, and associated wetlands downstream.

On private lands in the four RTI sample counties, for example, the area of increased risk is on a minimum of about 2,680 miles of forest roads. These are roads on properties for which RMAPs would be required under Alternative 1, but Checklist RMAPs or no RMAPs would be required under Alternatives 2 and 3. A minimum of 2,126 miles of forest roads in the four RTI sample counties could be assessed using Checklist RMAPs; RMAPs and annual progress reports would be not required. A minimum of 554 miles of small forest landowner forest roads would be exempt from Checklist RMAP requirements. Alternatives 2 and 3 would pose a greater risk of continued runoff, erosion, and water quality impacts to surface waters at local small forest landowner sites and streams compared to Alternative 1. A minimum of approximately 9,521 miles of roads are on industrial forest lands (defined above), where RMAPs would be required under Alternatives 2 and 3.

Based on the RTI data, approximately 67,730 acres of private forest lands with a high probability of slope instability in the three westside sample counties are owned by large forest landowners who would be required to submit RMAPs (Table 3.2-3). About 10,527 acres are owned by small forest landowners who would be required to submit Checklist RMAPs. An additional 1,904 acres are owned by 80/20 landowners, who would not be required to complete RMAPs.

All Alternatives

Landowner participation in the FFFPP cost-share program would not be expected to result in any differences in effects to water quality under any of the alternatives. The requirement for repairs to culverts that both serve as barriers to fish passage and have adverse impacts on water quality would be expected to be similar among alternatives. The potential for adverse impacts to water quality would be associated primarily with in-stream culvert replacement work. The total amount of in-stream work would likely be similar among alternatives, because they do not differ with regard to the requirement that fish passage barriers must be remedied.

To the extent that repair work occurs within or adjacent to streams, construction machinery and activities associated with road maintenance and abandonment may also contribute sediment to streams. The risk of any resultant adverse effects would be minimized, however, by BMPs developed through permitting processes at the state (e.g., hydraulic project approval and forest practices application/notification) and federal levels and would likely be offset by water quality improvements over the long term.

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3.3 RIPARIAN AREAS

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3.3.1 Introduction

This section describes the riparian ecosystem and the five riparian functions listed in the forest practices rules. It also describes the current condition of riparian areas on small forest landowner properties, the types of road management activities that could occur in riparian areas, and the likely effects of the alternatives on the condition of riparian areas on small forest landowner properties. Although riparian areas include instream habitat and stream channels, adjacent floodplains, and wetlands (which often include seeps and springs), this section focuses on stream riparian areas. A discussion of riparian buffer protection for wetlands can be found in Section 3.4 Wetlands.

A wide variety of hydrologic, geomorphic, and biotic processes determines the character of riparian areas. Riparian areas have distinctive resource values and characteristics that make them important zones of interaction between terrestrial and aquatic ecosystems. During the scoping for this EIS, the effects of proposed changes to the forest practices rules relative to road maintenance and abandonment on riparian areas were identified as important issues.

3.3.2 Affected Environment

This section provides an overview of riparian functions and describes the current condition of riparian areas on small forest landowner properties.

3.3.2.1 Riparian Functions

Forest practices recognize that the functions of stream riparian areas include large woody debris (LWD), leaf and needle litter recruitment, stream shade, nutrients, stream bank stability, sediment control, and other riparian features that are important to both riparian forest and aquatic system conditions. Preliminary analysis indicated that road maintenance and road maintenance planning would not affect LWD potential, leaf and needle litter recruitment potential, stream shade, or nutrients because maintenance of existing roads would not change the footprint of the road prism. In contrast, these functions would be affected by road abandonment. However, it was assumed that the different rules under the alternatives would not substantially change a small forest landowner's decision regarding road abandonment. Consequently, the riparian functions of LWD potential, leaf and needle litter potential, shade, and nutrients will not be discussed further. The following describes riparian functions related to streambank stability and sediment control.

The delivery of fine and coarse sediment to streams can lead to stream channel instability, pool filling by coarse sediment, creation of spawning gravels, or introduction of fine sediment to spawning gravels. Sediment can be delivered to the aquatic system as surface erosion (mostly fine sediment) generated from stream adjacent parallel roads and/or water crossings. It can also be delivered as landslides or debris torrents (coarse and fine sediments), whether initiated naturally or in harvested areas or from roads located on

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unstable slopes. Stream-adjacent parallel roads reduce the sediment filtering capacity of a riparian area by replacing productive forest and other vegetation with compacted soil and gravel surfaces that more easily transport water and fine sediment. Roads located in riparian areas adjacent to streams and at water crossings can increase the rate and intensity of landslides and debris flows (Furniss et al., 1991). Additional discussion of surface erosion and landslides is provided in Section 3.2, Water Resources.

3.3.2.2 Current Riparian Conditions

Historically, Pacific Northwest forests (including riparian areas) were a mosaic of different forest types and ages and large areas of older late seral stage forest were common (Franklin et al., 1981). However, compared to upland forests, riparian areas are more frequently disturbed by fluvial processes and can have more diverse stands than upland areas (Agee, 1988).

The Forest Practices Rules HCP Draft EIS (NMFS and USFWS, 2005) reported that riparian areas in Washington were dominated by early seral stage forests. In one study, early seral stages included recently harvested areas, or areas with pole-sized or smaller conifer or hardwood stands less than 12 inches in diameter at breast height (Washington FPB, 2001). In a second study, early seral stage was defined as hardwood-dominated, shrub, and clearcut areas with less than 70 percent conifer crown cover or less than 75 percent from hardwoods or shrubs (Lunetta et al., 1997 as cited in NMFS and USFWS, 2005). The studies reported that for private forest lands over half of the riparian areas were in early seral stages of forest. In some westside non-fishbearing streams, and in all eastside streams, the proportion in early seral stages exceeded 60 percent of the riparian areas. The studies suggest somewhat different conclusions for the amount of late-seral stages in riparian stands. The study prepared for the Forest Practices Rules EIS (Washington FPB, 2001) reported that approximately 1 percent of westside riparian areas and 5 percent of eastside riparian areas consisted of late-seral forest. In contrast, the Lunetta et al. (1997 as cited in NMFS and USFWS, 2005) study indicated from 5 to 19 percent of riparian areas of the low-gradient (less than 4 percent) streams studied in western Washington included late-seral stage stands. While the two studies are not directly comparable due to differences in seral stage definitions and types of streams studied, both provide evidence of a seral-stage distribution in riparian areas that is substantially different than historical conditions.

No information is currently available to discern whether patterns of seral stage distribution in riparian areas on small forest landowner properties are similar to or different than the general pattern observed more widely on forest land ownerships in Washington. However, it is likely those conditions could vary more widely than the general pattern, because the forest management goals of small forest landowners are likely to be more varied and less intensive than for large forest landowners for whom timber harvest is either a primary goal or a principal part of a public mandate. Consequently, it is possible that many small forest landowner properties have a higher proportion of mid- to late-seral stage riparian stands and lower amounts of early seral stage stands than observed over the general landscape.

Historic practices have utilized the flat floodplains along rivers for road building. This has removed riparian vegetation, albeit only a very small proportion relative to historic timber harvest practices. In narrow canyons with limited floodplains, roads commonly have been located on the sideslope within the riparian zone. Even in the absence of these longitudinal impacts, the continuity of the riparian corridor has been interrupted at each bridge and culvert crossing. Consequently, roads built in riparian lands have contributed to changes in the riparian forest structure and composition and caused land disturbance. It should be

recognized that most historic management activities on forest lands occurred under rules substantially less restrictive than those currently in place.

The changes due to roads have caused the reduction of some or all riparian functions within riparian lands depending on where road construction has occurred. One example is the loss of LWD potential from trees that were removed within the road corridor during construction. Major changes to the aquatic system have also resulted from riparian land modifications due to road development, including the straightening or simplification of the stream channel system (Beschta et al., 1995; Kondolph et al., 1996; Knutson and Naef, 1997).

Currently, no specific information on statewide road density or distribution of roads in riparian areas is available for small forest landowner properties or forested lands in general. In eastern Washington, road building has allowed greater access for forest management and some types of recreation, but it has also contributed to the protection of the forest from the spread of fires and catastrophic outbreaks of insects. Railroads were also built into some areas, and over time many railroad grades were converted to roads. In the past, the decision of where and when to build forest roads hinged primarily on the logistics of timber harvest (Oliver et al., 1994).

In conclusion, the distribution of stand development stages within riparian areas suggests that many streams may have reduced levels of one or more riparian functions under current conditions because of low to moderate levels of large, fully functioning stands. In contrast, under historical, unmanaged conditions, high levels of these stand types were common. These areas are likely to remain in this status for the near future, because they contain moderate to high levels of early stand development stages. These riparian stand conditions are primarily the result of historic harvest in riparian areas that is curtailed under current forest practices rules. Existing stream adjacent parallel roads have contributed to reduced riparian functions by removal of the road corridor from productive forest.

3.3.3 Environmental Effects

This EIS specifically examines the effects of proposed changes in forest practices rules related to RMAP planning on small forest landowner properties. The following provides a discussion of the general effects of forest road maintenance on riparian functions. The potential adverse effects of the alternatives are discussed. For this analysis, the differences in proposed rule language between Alternatives 2 and 3 would not be expected to result in practical changes in road maintenance or construction. Consequently, the effects of Alternatives 2 and 3 on riparian areas are considered similar and are addressed together.

Development of permanent roads removes trees within the road corridor, disturbs stream banks, and may provide a pathway for the transport of water and sediment from the roadway to a stream. Protection of stream bank integrity and adequate soil filtering of surface erosion are generally maintained with a fully functioning stand within 30 feet of a stream (Washington FPB, 2001).

Under the proposed alternatives analyzed in this EIS, new road construction standards under the forest practices rules would be the same for both large and small forest landowners. In addition, all proposed alternatives have the same goal of fixing existing road problems (i.e., roads that currently or potentially could cause damage to a public resource) by July 1, 2016. The primary differences among the alternatives relate to how and when problem road sections on small forest landowner lands would be identified, documented, and reported to the DNR. All of the alternatives rely extensively, but not exclusively, on landowners to self-report problem road sections on their lands, but through

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different RMAP processes. The different processes affect the rate at which problems would be expected to be addressed by the landowner because under Alternatives 2 and 3 many small forest landowners may not submit an FPA/N and checklist RMAP until after July 1, 2016. In contrast, under Alternative 1, all small forest landowners would be required to submit an RMAP by 2006 and make corrective actions for problem road sections by 2016.

3.3.3.1 Evaluation Criteria

The following criteria were used to evaluate the specific effects of the alternatives on riparian functions: riparian disturbance, sediment delivery to streams, and stream bank stability. Roads located in riparian zones have a higher risk of contributing fine and coarse sediment to streams from regular use and in the event of road failure (see Section 3.2 Water Resources). In the event of road failure, LWD could also be delivered to streams.

3.3.3.2 Comparison of Alternatives

The following discusses the effects of the alternatives on riparian functions using the criteria outlined above.

Alternative 1 (2001 Rules)

Under Alternative 1, small forest landowners must make improvements to roads to meet Forest Practices Rules standards by July 1, 2016. Small forest landowners would be required to prepare an RMAP by July 1, 2006, that identifies problem road sections and includes a plan to improve roads with an even flow of improvements occurring over the 15-year period with the worst sections usually repaired first. Under Alternative 1, an RMAP would require substantially more detail than a Checklist RMAP. For example, under Alternative 1 all forest roads on a landowner's property would have to be depicted on a map including orphan roads and roads planned for abandonment. Potentially affected wetlands and typed water would also be displayed. Small forest landowners would also be required to submit annual reviews describing accomplishments during the previous year. The higher level of detail required for RMAPs under Alternative 1 and the mandatory planning requirement increase the likelihood that problem road sections in riparian areas would be identified and repaired by 2016. Consequently, Alternative 1 would have a lower risk of road failures in riparian areas relative to Alternatives 2 and 3.

Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095 with Clarifications)

The reporting process would be simpler for small forest landowners under Alternatives 2 and 3 than under Alternative 1, but the ultimate goal of protecting public resources is the same. Under Alternatives 2 and 3, small forest landowners are responsible for maintaining their forest roads in a condition that would not cause damage to a public resource, but do not have to meet the annual reporting requirements specified in the forest practices rules. Under Alternatives 2 and 3, small forest landowners are required to provide a simplified Checklist RMAP for roads to be used as part of the forest practice when they submit a FPA/N. In contrast, the RMAP submitted under Alternative 1 would include all forest roads on a landowner's property statewide. Also, the Checklist RMAP does not provide a plan or schedule for fixing problem road sections. Furthermore, for 80/20 landowners (approximately 7 percent of the private forested land area, based upon the RTI data for four counties [Table 3.1-1]), no RMAP is required, checklist or otherwise. Road problems identified from the Checklist RMAP and/or the FPA/N process can result in the development of a road repair plan and schedule by DNR and the small forest landowner. It

is possible that small forest landowners with ownerships greater than 80 acres will not harvest timber prior to July 1, 2016, and consequently a Checklist RMAP may not be prepared for these lands within this time period.

As a result of this lack of mandatory planning, Alternatives 2 and 3 may pose a higher risk of problem road sections going undetected and therefore not being fixed by July 1, 2016, compared to Alternative 1. In essence, Alternatives 2 and 3 place a higher level of responsibility for detecting problems on the state and rely on the state to identify and repair problem road sections on their land that currently or may potentially cause damage to a public resource. DNR uses the Small Forest Landowner Office and its programs to aid small forest landowners in achieving good stewardship on a proactive basis, but use of the programs, management tools, and educational information is voluntary. Over the long term, for those small forest landowner lands where Checklist RMAPs are eventually prepared, the level of certainty for fixing problem road sections is dependent upon both the level of stewardship by small forest landowners and the level of scrutiny and enforcement provided by DNR and other agencies.

Due to the higher probability that problem road sections would not be identified or fixed in a timely manner under Alternatives 2 and 3 relative to Alternative 1, Alternatives 2 and 3 would pose a higher likelihood of adverse impacts to riparian resources due to road failures in riparian areas. Although generally occurring at a relatively low frequency, these road failures (especially those that are large in size) may destabilize stream banks, deliver woody debris and coarse and fine sediment to streams, and disturb riparian buffers that filter sediment from the roadway and upslope areas.

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3.4 WETLANDS

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3.4.1 Introduction

Wetlands are defined in terms of their physical, chemical, and biological characteristics, such as hydrologic regime, soil type, and plant species. Wetlands are defined as those areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (40 CFR 230.41(a)(1)) and WAC 222-16-10). This definition includes swamps, bogs, fens, and other similar areas. Wetlands on small forest landowner properties are regulated at both the federal and state levels. The primary regulations applicable to wetland resources are Sections 404 and 401 of the CWA, which is administered by the U.S. Army Corps of Engineers (Corps) and Washington State Department of Ecology (which administers the regulations of the U.S. Environmental Protection Agency [EPA] in Washington State). The CWA is intended to protect the biological, physical, and chemical integrity of the waters of the United States.

Wetland ecosystems provide important benefits to the environment as well as society through a variety of physical and biological functions. The National Wetland Policy Forum (Conservation Foundation, 1988) identified eight natural functions that wetlands may perform at a landscape level. These functions are (1) nutrient removal and transformation; (2) sediment and toxicant retention; (3) shoreline and bank stabilization; (4) flood flow alteration; (5) groundwater recharge; (6) production export; (7) aquatic diversity and abundance; and (8) wildlife diversity and abundance. In addition, wetlands may provide important benefits to society such as cultural and socioeconomic value (Mitsch and Gosselink, 2000; Null et al., 2000).

3.4.2 Affected Environment

3.4.2.1 Historic/Current Wetland Protection

Wetlands are subject to regulation under Sections 401 and 404 of the CWA, which is administered by the Corps and EPA (Department of Ecology in Washington State). Discharge into wetlands may also be regulated under Section 402 of the CWA. Exemptions granted under Section 404(f)(1) allow for normal agricultural, ranching, and silvicultural activities, as well as maintenance of existing drains, farm ponds, and roads. The construction or maintenance of forest roads for silvicultural purposes is exempt from regulation when such roads are constructed and maintained in accordance with BMPs. The BMPs “assure that flow and circulation patterns and chemical and biological characteristics of water of the United States are not impaired, that the reach of the waters of the United States is not reduced, and that any adverse effect on the aquatic environment would be otherwise minimized” (CWA Section 404(f)(1)(E)).

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3.4.2.2 Wetland Functions

As noted above, wetlands provide a variety of functions and values. The key wetland functions that are the focus of this EIS include hydrology, water quality, and fish and wildlife habitat. These functions were chosen because they have the highest probability of being adversely affected due to direct impacts from road maintenance and abandonment related activities. The functions are briefly discussed below. Preliminary analysis indicated that road maintenance and road maintenance planning would not affect wetland connectivity because maintenance to existing roads would not change the footprint of the road prism. This function may be affected by road abandonment, however. It was assumed for this analysis that the different rules under the alternatives would not substantially change a small forest landowner's decision regarding road abandonment. Consequently, wetland connectivity will not be discussed further.

Hydrology

Headwater riverine and depressional wetlands can delay discharge of peak runoff into streams and impede passage of overbank flow downstream during storm events, thus reducing the potential for downstream flooding (Winter, 1988; Roth et al., 1993).

Depressional wetlands (i.e., wetlands that may or may not have an outlet and that occur in topographic depressions with closed contours on three sides and for which movement of surface water and shallow subsurface water is toward the lowest point of the depression) can also help maintain existing quantities of groundwater by delivering water to underlying aquifers (Dinicola, 1990; Economic and Engineering Services Inc., 1991). Additionally, wetlands can help maintain minimum stream base flow by naturally regulating the release of groundwater discharge into streams and by recharging aquifers that discharge groundwater to streams (Hidaka, 1973; O'Brien, 1988; Dinicola, 1990; Mitsch and Gosselink, 2000). This function is assessed by such parameters as the wetland type and size, type of outlet, amount of forested cover, and position in the watershed.

Water Quality

Wetlands can improve water quality by removing and retaining sediments and nutrients/pollutants from the water to keep them from moving downward through a watershed. This function is assessed according to such parameters as the size and type of the wetland, the presence of slow-moving water in the wetland, density of herbaceous vegetation, soil type, the ability for water to pond within the wetland, and proximity to excess sediment and nutrients/pollutants.

Fish and Wildlife Habitat

Wetland and riparian habitats are considered to be among the richest zones for aquatic and terrestrial organisms (Clark, 1977; Dodd, 1978; Brinson et al., 1981; Kauffman and Krueger, 1984). Eighty-six percent (359 out of 414) of the terrestrial vertebrate species in western Washington and 85 percent (320 out of 378) of terrestrial vertebrate species in eastern Washington use wetland and associated riparian habitats for portions of their life needs (Thomas, 1979; Brown, 1985) (See Section 3.6 Wildlife). Wetlands also provide habitat or perform functions that contribute to the health of ecosystems of many anadromous and resident fish species within Washington (see Section 3.5 Fish). This function is assessed according to characteristics of type, structure, diversity, native plant richness, and percent vegetation cover, as well as connectivity to other habitat types.

3.4.2.3 Existing Condition of Wetlands

Since the time of colonization, Washington State has lost 30 to 50 percent of its wetlands (USFWS, 1999). Additionally, the functions of existing wetlands have been reduced. Various factors have contributed to wetland loss and wetland function reduction including agriculture development, urbanization, timber harvest, road construction, and other land management activities.

It is difficult to assess the current conditions of wetlands in forested lands across the entire state. However, some wetlands on lands subject to forest practices rules have been altered in the past due to timber harvest and road building. These actions can impact wetlands directly through vegetation alteration, soil compaction, and changes in hydrologic regime and water quality or indirectly through sedimentation from adjacent land management practices. Additionally, harvest of trees in or adjacent to wetlands can impact microclimates of wetlands. Other impacts to wetlands have likely occurred from fires and other natural disturbances.

Overall, approximately 4.4 percent of the land base subject to the forest practices rules consists of wetland habitats (Washington FPB, 2001). Wetland areas make up approximately 2 percent of the land base on the east side of the Cascades and approximately 6 percent on the west side. Wetlands are described in this document using the DNR wetland GIS coverage, which is based on NWI (USFWS, 1999). DNR's wetlands GIS data layer was combined with the county-based small forest landowner GIS data to indicate the types and area of wetlands that may be affected by the alternatives.

3.4.3 Environmental Effects

This section describes the general effects on wetlands and associated functions from road management, specifically RMAP requirements on small forest landowner properties. Effects related to road maintenance include alteration of hydrology, water quality degradation, and changes to fish and wildlife habitat. Additional effects to wetlands from other forest management activities are provided in the Forest Practices Rules EIS (Washington FPB, 2001).

3.4.3.1 Evaluation Criteria

The following discussion of environmental effects on wetland resources relies on the evaluation results from Sections 3.2 Water Resources and 3.3 Riparian Areas. The evaluation criteria for analyzing the alternatives and associated impacts are primarily qualitative. The probable direction (increase, decrease, no change) and relative magnitude of probable impacts was determined for the following: (1) wetland connectivity, (2) filling of adjacent wetlands, (3) hydrologic functions, (4) water quality functions, and (5) fish and wildlife habitat functions.

Filling of Adjacent Wetlands

Direct effects of road maintenance in wetlands may include permanent elimination of area and support of functions (i.e., fish and wildlife habitat, water quality, and hydrology) from the affected portion of the wetland. This may occur from heavy equipment inadvertently moving soil from roads into adjacent wetlands during maintenance activities or repairs. Unlike new road construction in wetlands, the effects of filling adjacent wetlands during road maintenance and repairs are typically limited to minimal amounts of fill in small areas. BMPs implemented during road maintenance can help minimize the potential for inadvertent fill and other associated adverse effects to wetlands. Conversely, if not maintained or repaired in a timely manner, roads are likely to undergo continual erosion

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and failure over time resulting in substantially more wetland fill. Overall, repairing a problem road poses a lower risk to wetlands and their functions than not repairing a problem road.

Hydrologic Functions

Existing roads crossing wetlands without adequate cross-drainage can alter hydrologic functions by flooding the upslope side and changing drainage on the downslope side of crossings (Stoekeler, 1967; Boelter and Close, 1974). If left alone, long-term effects to wetlands may include increasing the existing wetland area upgradient of the problem cross-drainage and decreasing the existing wetland area downgradient of the problem cross-drainage. Inspection and prompt repair of such problems can minimize the effects of roads on the hydrological functions of wetlands.

Water Quality Functions

Similar to water crossings described in Section 3.5 Fish, road failures at any wetland crossing can result in excess sediment input. At the same time, repairs of such road failures and other road maintenance activities have the potential to deliver excess sediment and pollutants to adjacent wetlands, diminishing water quality. BMPs help avoid or minimize adverse effects to water quality functions during equipment operation associated with maintenance activities. Overall, repairs of problem roads and ongoing road maintenance pose a lower risk to water quality functions than not repairing or maintaining roads.

Fish and Wildlife Habitat Functions

Fish and wildlife habitat functions are affected by the construction, use, and maintenance of forest roads in wetlands. The persistence of forest roads in wetlands perpetuates the effects caused by the original construction (i.e., fragmentation of habitat). Fish and wildlife habitat functions in wetlands may also be affected by changes in wetland size or location (as a result of hydrologic alteration from cross-drainage problems) and water quality degradation from roads that are not maintained. Overall, problem road repairs and ongoing road maintenance pose a lower risk to fish and wildlife functions than not repairing or maintaining roads.

3.4.3.2 Comparison of Alternatives

All of the proposed alternatives share the goal of repairing or improving all problem roads to protect public resources by 2016. Under each alternative, if DNR determines that a road will cause or has the potential to cause damage to a public resource, the DNR may require a landowner to submit a compliance schedule to fix the problem identified. The primary differences among the alternatives relate to how and when problem road sections are identified, documented, and reported to the DNR.

Alternative 1 (2001 Rules)

Alternative 1 would require all forest landowners (including small forest landowners) to prepare an RMAP by July 1, 2006, and improve all forest roads to forest practices rule standards by July 1, 2016.

Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095 with Clarifications)

Under Alternatives 2 and 3, 80/20 landowners would not be required to submit an RMAP. Remaining small forest landowners who do not fall in this category would be required to fill out a Checklist RMAP when applying for an FPA/N. Small forest landowners participating in the FFFPP are not required to remove, replace, or repair fish passage barriers until cost share funding is available and higher priority barriers in the watershed

have been removed or funded. Therefore, it is possible that not all fish passage barriers on small forest landowners' properties would be improved by July 1, 2016, and problems would be addressed at different rates. As discussed in Section 3.3 Riparian Areas, landowners would be required to report problem road sections under all three alternatives, but through different RMAP processes.

DNR GIS data identify approximately 44,080 acres of wetlands on small forest landowner, possible small forest landowner, and industrial forest landowner properties in the four counties for which RTI small forest landowner data are available (Table 3.4-1). Under Alternatives 2 and 3, RMAPs would be required on properties that support 23 percent of the wetlands identified above, and Checklist RMAPs would be required on 60 percent. Approximately 17 percent of the wetlands on forest landowner properties in the four sampled counties occur on 80/20 landowner properties. Owners of such parcels would not be required to prepare RMAPs under Alternatives 2 and 3. Not all wetlands are affected by roads; for this analysis, the acreage of wetlands on forest lands managed by different landowner types is used as an indicator of the potential for wetlands to be affected by roads.

Table 3.4-1. Wetland Area (acres) on Private Parcels for which RMAPs Checklist RMAPs or No RMAPs Would Be Required under Each Alternative¹

	Forested	Nonforested		Other ²	Total
		Type A	Type B		
Alternative 1					
RMAP ³	12,684	29,638	301	1,457	44,080
Alternatives 2 & 3					
RMAP ³	2,321	7,140	128	519	10,108
Checklist RMAP ⁴	8,109	17,533	131	727	26,500
No RMAP ⁵	2,254	4,965	42	211	7,472

¹ Data are based on small forest landowner data provided by RTI for four counties within the project area.

² Comprises open water wetlands and nonforested wetlands that do not fit Type A or B.

³ RMAPs would be required for all forest landowners under Alternative 1 and large forest landowners under Alternatives 2 and 3. For this analysis, forest landowners include industrial landowners, small forest landowners, and possible small forest landowners, as identified by RTI

⁴ Checklist RMAPs would be required for small forest landowners under Alternatives 2 and 3. Since GIS is unable to identify small forest landowner properties using a harvest-based criterion (two MMBF per year), forest ownerships less than 5,000 acres were identified as small forest landowner properties (determined by assuming a 400-board-foot per-acre, per-year production level and an 80-year rotation).

⁵ RMAPs would not be required for 80/20 landowners.

The effects on wetlands under Alternatives 2 and 3 would be the same, because the difference in rule language between these alternatives would not result in practical changes in road maintenance. Therefore, Alternatives 2 and 3 are discussed together for each criterion. Effects to forested, Type A, and Type B wetlands would not differ among the alternatives.

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Filling of Adjacent Wetlands

Alternative 1 (2001 Rules)

Under Alternative 1, improvements and maintenance would be prioritized for achieving the most benefit to public resources early in the period. Current road maintenance standards would be implemented, and all non-functional culverts would be scheduled for repair or replacement by July 1, 2016. Alternative 1 would have a slightly lower risk of adverse effects than the other alternatives because road maintenance standards would be attained at a relatively faster rate.

Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095 with Clarifications)

Fixing a problem road poses a lower risk to wetlands and their functions than not repairing a problem road. Under Alternatives 2 and 3, fill associated with road failures could go undetected, and repairs could be delayed because small forest landowners would not be required to submit a Checklist RMAP until an FPA/N was submitted. Moreover, small forest landowners who do not submit an FPA/N would not be required to submit a Checklist RMAP. Compared to Alternative 1, Alternatives 2 and 3 would likely increase the time required to meet the overall goal of repairing or improving all problem roads to protect public resources by July 1, 2016, thereby increasing the risk of adverse impacts to adjacent wetlands from fill associated with road failures.

Hydrologic Functions

Alternative 1 (2001 Rules)

Under Alternative 1, improvements and maintenance would be prioritized for achieving the most benefit to public resources early in the period. Drainage problems would be identified and scheduled to be remedied by July 1, 2016. Although all three alternatives would have nearly the same level of risk to wetland hydrology, Alternative 1 would have a slightly lower risk of adverse impacts to hydrologic functions, because problems would be identified during mandatory planning.

Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095 with Clarifications)

Alternatives 2 and 3 do not include mandatory planning, resulting in a slightly higher risk of adverse impacts to hydrologic functions because road maintenance needs may not be identified in a timely manner. This increases the possibility of long-term hydrologic alterations to wetlands. As discussed in the Section 3.5 Fish, road segments with drainage problems may not be identified and corrected until a small forest landowner submits an FPA/N, potentially causing a delay in repairs (beyond July 1, 2016), or not reporting the problems at all if the small forest landowner does not submit an FPA/N.

Water Quality Functions

Alternative 1 (2001 Rules)

Under Alternative 1, all forest roads owned by forest landowners would be included in an RMAP by July 1, 2006. Sources of sediment delivery would be identified and placed on a schedule to be repaired. Therefore, Alternative 1 would pose a lower risk of adverse impacts due to excessive road-related sediment delivery than Alternatives 2 and 3.

Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095 with Clarifications)

Alternatives 2 and 3 would likely pose a higher risk of ongoing or future adverse impacts to water quality functions. These alternatives would not require small forest landowners to submit a Checklist RMAP until an FPA/N is submitted. During this time, some road problems unrelated to fish passage concerns may go undetected, delaying improvements to problem road sections and road crossings. If a small forest landowner does not submit an FPA/N, the problems may continue without any reporting.

Fish and Wildlife Habitat Functions

Alternative 1 (2001 Rules)

Under Alternative 1, preparation of RMAPs by July 1, 2006, would reduce the risk of small forest landowner roads adversely affecting wetland functions, including fish and wildlife habitat. The risk of causing further degradation to fish and wildlife habitat functions would be lower than Alternatives 2 and 3 because all forest landowners would be required to identify road-related problems through an RMAP.

Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095 with Clarifications)

Under Alternatives 2 and 3, small forest landowners would have relaxed RMAP reporting requirements and, if they apply for the FFFPP, they would have an unspecified schedule for repairing fish passage barriers. Both these conditions result in a slightly greater risk of adverse impacts to fish and wildlife habitat functions, because these fish passage barriers would likely be repaired and maintained at a relatively slower rate. Road segments with cross-drainage problems may not be identified and corrected until a small forest landowner submits an FPA/N, potentially causing a delay in repairs (beyond July 1, 2016), or not repairing the problems at all if the small forest landowner does not submit an FPA/N.

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3.5 FISH

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3.5.1 Introduction

Fish species are important natural resources that have ecological, economic, and cultural significance in the State of Washington. Pacific salmon and trout are good indicators of a properly functioning aquatic ecosystem, because they require cool, clean water, complex channel structures and substrates (beds under water bodies), and low levels of fine sediment (Bjornn and Reiser, 1991). In addition, Pacific salmon and trout populations have provided viable commercial and sport fishing industries.

Numerous factors affect fish population numbers, which can be highly dynamic. Many of these factors are unrelated to forest practices. Consequently, this analysis focuses on fish habitat rather than population numbers.

The effects analysis relies heavily on analyses presented elsewhere in this document including Section 3.3 Riparian Areas and Section 3.2 Water Resources.

3.5.2 Affected Environment

3.5.2.1 Priority Species

Fish species selected as the focus of this analysis include the following salmon: chinook, coho, sockeye (both sea-run and resident kokanee), and chum; and the following trout: steelhead, rainbow, coastal cutthroat, bull, and Dolly Varden. These species were selected because most have runs that are listed as threatened or endangered under the federal ESA or are a candidate species for listing. All of the species identified above have commercial or sport harvest value and are known to be sensitive to forest management activities. See page 3-121 of the Forest Practices Rules EIS (Washington FPB, 2001) for additional details regarding these species.

3.5.2.2 Aquatic Ecosystem (Habitat Components)

Key physical components of the aquatic ecosystem include channel morphology or structure (floodplains, streambanks, channels), water quality, and water quantity. Habitat complexity is created and maintained by rocks, sediment, LWD, and favorable water quantity and quality. Upland and riparian areas influence aquatic ecosystems by supplying sediment, woody debris, and water. Disturbances such as landslides and floods are important mechanisms for delivery of wood, rocks, and pebbles that contribute to the streambed.

Natural channels are complex and contain a mixture of habitats differing in depth, velocity, and cover (Bisson et al., 1987). They are formed during storm events that have associated water flows that mobilize sediment in the channel bed (Murphy, 1995). The hydrology, or the way water moves through the watershed, combined with its geology, hillslope characteristics, and riparian vegetation determines the nature of stream channel

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morphology (Sullivan et al., 1987; Beschta et al., 1995). Therefore, activities in these areas would be expected to affect the shape and form of the stream channel. For example, substantial increases in volume and frequency of peak flows can cause streambed scour and bank erosion. A large sediment supply may cause aggradation (i.e., filling and raising the streambed level by sediment deposition) and widening of the stream channel, pool filling, and a reduction in gravel quality (Madej, 1982). Upslope activities (e.g., timber harvest, land clearing, and road development) can change channel morphology by altering the amount of sediment or water contributed to the streams. This, in turn, can disrupt the balance of sediment input and downstream movement in a stream reach (Sullivan et al., 1987).

In many parts of Washington State, one or more of the fish species mentioned above are considered to be in a depressed population status. In addition, many are listed as threatened or endangered under the ESA or as species of concern by the State of Washington. Among other things, degraded aquatic habitat conditions in forested environments are commonly cited as a major influence on the population status (see Section 3.7.2 of the Forest Practices Rules EIS [Washington FPB, 2001]). The following describes components of the aquatic ecosystem that are influenced by forest roads. These include coarse sediment, fine sediment, hydrology, forest chemicals, and fish passage.

There are four additional habitat components of the aquatic ecosystem that are often considered when evaluating the effects of forest practices and forest roads. These include LWD, leaf/needle litter recruitment, floodplains and off-channel features, and water temperature (shade). With the exception of floodplains and off-channel features, these habitat components are related to functions described in Section 3.3 Riparian Areas. During the analysis of the effects of the alternatives on these functions, it was concluded that there are no differences among the alternatives because any effects would be related to levels of road abandonment, which are likely to be similar among the alternatives. Similarly, floodplains and off channel features are not likely to be affected by maintenance of existing roads under any of the alternatives. Consequently, no further discussion of LWD, leaf/needle litter recruitment, floodplains and off-channel features, and water temperature (shade) will occur in Section 3.5 Fish.

Coarse Sediment. Bedload material is necessary to provide substrate for cover and spawning habitat for fish. However, increased levels of coarse sediment bedload above background levels can lead to stream bank instability, pool filling, and changes in the water transport capacity of the channel (Spence et al., 1996). Higher flows are required to mobilize larger sediment sizes. Consequently, the recovery period for streams with severe coarse sediment aggradation could range from decades to 100 years or more. The major factors influencing the excessive delivery of sediment to a stream include the intensity and location of stream bank erosion, mass-wasting events, and road and culvert failures.

Fine Sediment. Fine sediment can degrade the quality of fish habitat by increasing water turbidity that restricts sunlight penetration. Sediment can also fill the pores between the gravel and prevent the flow of oxygen-rich water to fish eggs that may be deposited there (Bjornn and Reiser, 1991). Fine sediments and larger particles such as sand-sized fractions can also smother fish eggs and developing young in the gravel, clog pores or breathing surfaces of aquatic insects, physically smother them, or decrease available habitat (Spence et al., 1996; Washington FPB, 2001).

Biological effects of increased turbidity may include a decrease in primary productivity of algae and periphyton due to the decrease in light penetration. Declines in primary productivity can adversely affect the productivity of higher trophic levels such as

macroinvertebrates and fish (Gregory et al., 1987). Turbidity can also interfere with feeding behavior or cause gill damage in fish (Hicks et al., 1991), but may provide some benefits. For example, it can provide cover from predators (Gregory and Levings, 1998).

Important factors related to forest roads that can influence the excessive delivery of fine sediment to a stream include the presence of wetlands (see Section 3.4 Wetlands) and road surface erosion (see Section 3.2 Water Resources).

Hydrology. The amount of water provided to aquatic ecosystems at critical times is important for sustaining fish and other aquatic species. Many fish species and populations have become adapted to natural flow cycles for feeding, spawning, migration, and survival needs. The timing, magnitude, and duration of peak and low flows must be sufficient to create and maintain riparian and aquatic habitat. Wetland areas serve a hydrological function by storing water and later releasing it directly to streams or through groundwater. In general, low- or base-level stream flows that occur during the late summer often limit habitat for rearing juvenile salmon and trout. High winter flows and floods that scour the streambed can be detrimental to eggs or young fish that may be incubating in the stream gravels. Rain-on-snow events are a common reason for flooding and streambed scour on the west side of the Cascade Mountains and can be influenced by management activities such as timber harvest and road maintenance (see Section 3.2 Water Resources).

Forest Chemicals. A common road maintenance practice is roadside spraying with herbicides to limit the spread of undesirable plant species. Herbicides that enter waterbodies can severely impair aquatic ecosystems either by sublethal (e.g., reduced growth) or lethal effects (e.g., fish kills).

Fish Passage. Upstream migration of adult salmon and trout to spawning areas or redistribution of rearing fish to potential habitat in upstream areas can be impeded or blocked by a number of different mechanisms. These mechanisms can include water temperature, dissolved oxygen, turbidity, and natural and man-made physical barriers (Bjornn and Reiser, 1991).

Water crossings are the most common passage barrier influenced by forest practices. Culverts can prevent passage due to high water velocities, restricted depths, excessive elevation of the culvert (too high above stream level) for successful entry, size and length, and other factors. Shallow water depths from conditions such as low flow can also impede or prevent passage by causing riffles between pools to become completely dry or lack sufficient depth for passage. Similarly, some debris jams at water crossings can prevent or delay upstream passage (Bates et al., 2003).

The number of fish passage barriers on small forest landowner properties is currently unknown because surveys have not been completed on a statewide basis using standard protocols. However, the economic analysis associated with the rule changes in Alternatives 2 and 3 (Krug, 2005) estimated numbers of fish passage barriers. This analysis produced extrapolated quantities from a sample analysis conducted by DNR during rule making for the 2001 rules. Using the quantities given Table 3 and Table 4 of the economic analysis, it can be estimated that of 26,077 fish passage barriers on private forest lands statewide, 5,105 (approximately 20 percent) may be present on small forest landowner properties.

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3.5.3 Environmental Effects

3.5.3.1 Evaluation Criteria

The effects to fisheries resources of the proposed alternatives will be evaluated based upon the fish habitat components described below. Additional information about these criteria can be found in the Section 3.7.3.1 in the Forest Practices Rules EIS (Washington FPB, 2001).

Hydrology. Forest roads can affect both base and peak flows by capturing and diverting runoff to streams. Changes in peak flows can also cause or exacerbate coarse and fine sediment delivery to streams or affect the ability of a culvert to pass water and debris from a large storm event. Drainage structures (relief culverts, ditches) minimize this potential effect by dispersing the runoff on to the forest floor. At larger watershed scales, roads have a relatively minor effect on peak flow relative to other factors such as the level of immature forest, but can be important at finer scales. Please see Section 3.2 Water Resources for additional discussion.

Fine and Coarse Sediment. Excessive fine and coarse sediment entering streams can result from roads located on unstable slopes or failures at water crossings. Inadequate road maintenance can increase this risk. Excessive coarse sediment can fill pool habitat and cause bank instability. Fine sediment can smother fish eggs and, in extreme amounts, abrade and clog fish gills.

Water Quality (Forest Chemicals). Roadside spraying of herbicides can adversely affect the aquatic ecosystem if conducted without proper care to prevent herbicides from entering water bodies.

Fish Passage. Concern about the ability of small forest landowners to fix fish passage barriers with fish passable structures was one of the driving forces behind SSHB 1095 and a major difference in the alternatives. Fish passage barriers reduce the amount of habitat available to fish for spawning and rearing statewide. Notably, standards for fish passage at water crossings and enforcement of fish passage requirements are under the jurisdiction of WDFW, not the DNR. However, information regarding fish passage from FPA/Ns and RMAP submittals is shared with WDFW.

3.5.3.2 Comparison of Alternatives

The following discussion analyzes and compares the effects of the proposed alternatives for each habitat component for fish: hydrology, fine and coarse sediment, LWD, leaf and needle recruitment, and fish passage.

Hydrology

Alternative 1 (2001 Rules)

Under Alternative 1, preparation of RMAPs and implementation of road improvements to current maintenance standards that include minimum culvert sizes would pose a lower risk of small forest landowner roads affecting hydrology by 2016, compared to Alternatives 2 and 3.

Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095 with Clarifications)

Compared to Alternative 1, Alternatives 2 and 3 would pose a higher risk that road sections with drainage problems might not be identified and corrected until a small forest landowner submits an FPA/N. This might not occur until after 2016, or perhaps not at all if forest landowners do not conduct harvests on their lands in the future. However, in the

event that DNR determines that a road will cause or has the potential to cause damage to stream hydrology, it retains the authority to require a landowner to fix the problem(s) identified.

Fine and Coarse Sediment

Alternative 1 (2001 Rules)

Under Alternative 1, all forest roads owned by forest landowners are required to be included in an RMAP by July 1, 2006. Alternative 1 would pose a lower risk of delivery of fine and coarse sediment than Alternatives 2 and 3 because sources of sediment delivery could be identified and placed on a schedule to be repaired.

Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095 with Clarifications)

Under Alternatives 2 and 3, small forest landowners would not be required to submit a Checklist RMAP until an FPA/N is submitted. Consequently, some road problems might go undetected, and improvements to problem road sections and the fixing of water crossings with problems unrelated to fish passage concerns might be delayed longer than under Alternative 1. Alternatives 2 and 3 would pose a higher risk of ongoing or future adverse effects from coarse and fine sediment to fish resources because forest landowners who do not submit an FPA/N would not be required to submit a Checklist RMAP. However, in the event that DNR determines that a road will cause or has the potential to cause damage to a public resource, it retains the authority to require a landowner to fix the problem(s) identified. This authority provides some mitigation to this risk because RMAPs are not the exclusive mechanism by which DNR may identify the need to enforce minimum road maintenance for problem road sections.

Water Quality (Forest Chemicals)

All Alternatives

Under all alternatives, the forest practices rules include requirements for the storage, handling, and application of forest chemicals, including herbicides used to manage undesirable vegetation along roadsides (chapter 222-38 WAC). Proper road maintenance can reduce the risk of these substances entering streams by diverting runoff from roads to the forest floor if the rules in chapter 222-38 WAC are not adequately followed. However, if the rules are followed, the reduction in risk is minimal. Consequently, there is no significant difference among the alternatives for forest chemicals.

Fish Passage

Alternative 1 (2001 Rules)

Under Alternative 1, all forest landowners are required to identify and fix fish passage barriers on forest roads by 2016. Relative to Alternatives 2 and 3, Alternative 1 provides a higher level of certainty that fish passage barriers would be identified and fixed prior to July 1, 2016. However, small forest landowners pay all the costs associated with the removal of fish passage barriers on their lands under Alternative 1. Consequently, there is a higher risk under Alternative 1 that some small forest landowners may change their management strategy in order to finance the repair or replacement of fish passage barriers. For example some small forest landowners may harvest timber sooner or at a higher level, or sell a portion of their land, which could lead to conversion to a non-forestry land use.

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Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095 with Clarifications)

Under Alternatives 2 and 3, the forest practices rules provide for a cost-share program (FFFPP) and a priority schedule for the repair or replacement of fish passage barriers. Small forest landowners who participate in the program are eligible for cost-share assistance for fixing fish passage barriers when they become a high priority regardless of when the landowner conducts a forest practice. The prioritization is based upon the number of salmon and trout species affected by the barrier, the amount of habitat that would be opened by removing the barrier, and the number and location of barriers upstream and downstream of the barrier in question. The prioritization scheme facilitates an efficient implementation of projects and use of the program funds. If there is a high level of participation by small forest landowners, the prioritization would be expected to open up blocked habitat more rapidly than under an unsystematic approach in which some barriers would be fixed while downstream barriers persisted. In contrast, small forest landowners who do not participate in the FFFPP would face the same requirements as Alternative 1 to remove fish passage barriers on their property by 2016. Similar to Alternative 1, barrier removals under these circumstances would incur a financial burden on the landowner, but many would have no practical benefits to migrating fish until downstream barriers on non-small forest landowner properties were also removed.

Under Alternatives 2 and 3, small forest landowners who are not 80/20 landowners and who submit an FPA/N by July 1, 2016, would also submit a Checklist RMAP. Based upon information from RTI data on small forest landowner parcels in four Washington counties and WDFW data on passage barriers, approximately 45 percent of the small forest landowner fish passage barriers in these counties are located on lands exempt from RMAP preparation (or approximately 3,000 of the small forest landowner passage barriers estimated in the draft economic analysis). In the absence of a Checklist RMAP or identification of fish passage barriers complemented by follow-up and enforcement, DNR has a limited ability to monitor the progress of small forest landowners in identifying and fixing fish passage barriers on their lands by July 1, 2016. Efforts to identify fish passage barriers are occurring in many areas of the state by a variety of entities and the WDFW maintains a database of the location of barriers when they are reported. However, fish passage barrier surveys have not been completed for a large portion of the state. The FFFPP provides assurance that barriers will be identified for small forest landowners who apply and ensures efficient implementation. The FFFPP also provides substantial financial incentives for a small forest landowner to apply.

The level of funding available to fix barriers by July 1, 2016, is not guaranteed. The DNR expects that funding for the FFFPP will be adequate to meet the goals of the forest practices rules, despite year-to-year fluctuations in funding levels. Under Alternatives 2 and 3, the potential that funding might be less than expected is addressed with check-in points with the legislature in 2008 and 2013 to evaluate the progress of the Checklist RMAP towards meeting the 2016 goal. Corrective action would be expected to occur if progress is not satisfactory.

Small forest landowners who do not choose to participate in the FFFPP are responsible for the entire cost of fixing passage barriers on their land. Under Alternatives 2 and 3, the forest practices rules do not provide a schedule for fixing passage barriers by small forest landowners who do not apply for an FPA/N.

All Alternatives. Under all alternatives there is the potential that some landowners may not comply with the state requirement to fix fish passage barriers. However, if the state determines that a water crossing is a fish passage barrier, it retains the authority to require a landowner to remove it.

3.6 WILDLIFE

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3.6.1 Introduction

This section describes the biology and analyzes the impacts of the proposed alternatives on wildlife species sensitive to the effects of small forest landowner road maintenance. As described in the analyses of Section 3.2 Water Resources, Section 3.3 Riparian Areas, Section 3.4 Wetlands, and Section 3.5 Fish, any potential adverse environmental effects of road maintenance (or the lack thereof) would be associated with impacts to water quality. Therefore, only stream-dwelling amphibians are discussed in this section. Effects to wildlife species associated with wetland habitats are addressed in Section 3.4.

3.6.2 Affected Environment

The following paragraphs provide an overview of the habitat associations of certain amphibian species that would most likely be adversely affected by the proposed alternatives. Discussions emphasize those life history aspects with the greatest potential to be affected by roads and road-maintenance activities within and adjacent to stream habitats.

This discussion focuses on five species of stream-dwelling amphibians that are considered sensitive to the effects of activities associated with forest road maintenance and abandonment. These species include the Rocky Mountain (inland) tailed frog (*Ascaphus montanus*), the coastal (Pacific) tailed frog (*A. truei*), the Cascade torrent salamander (*Rhyacotriton cascadae*), the Columbia torrent salamander (*R. kezeri*), and the Olympic torrent salamander (*R. olympicus*). These species were selected for analysis because they are closely associated with aquatic habitats and because they are considered sensitive to timber harvest and other activities (e.g., road construction and maintenance) near streams. Aquatic habitats have the greatest potential among wildlife habitats to be affected by RMAP planning.

3.6.3 Environmental Effects

This section identifies and describes the criteria by which the alternatives were evaluated with regard to their potential for significant adverse environmental impacts to wildlife species and habitats. Discussions also provide an overview of the general effects of road management on wildlife, and assess the potential effects of the alternatives. Comparisons of the alternatives are based primarily on analyses presented in Sections 3.2 Water Resources, 3.3 Riparian Areas, and 3.5 Fish. For this analysis, differences in rule language for road construction and maintenance are not expected to result in different impacts to wildlife habitats and species under Alternatives 2 and 3. Consequently, the effects of both alternatives on wildlife are addressed together.

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3.6.3.1 Evaluation Criteria

As noted above and in Sections 3.2 Water Resources, 3.3 Riparian Areas, and 3.5 Fish, the only wildlife habitats with the potential to be adversely affected by differences in road maintenance planning under the alternatives are the aquatic habitats used by stream-dwelling amphibians. Specifically, delays in the identification of road-related problems that are contributing sediment to streams may render some areas inhospitable for those species. Therefore, only one criterion, water quality, was chosen to evaluate the potential impacts of the proposed alternatives on wildlife. The following paragraphs describe the ways in which this element of the environment may influence tailed frogs and torrent salamanders. The effects of the alternatives are addressed in Section 3.6.3.2.

Road maintenance and abandonment may affect wildlife species most directly through impacts to water quality. Increased sediment input from inadequately maintained roads, for example, may smother eggs of stream-breeding amphibians or reduce the availability of interstitial space used for cover and breeding. Such impacts may be associated with short-term increases resulting from in-water work for culvert replacement activities, or long-term increases resulting from inadequate drainage and stormflow controls. Sediment input may result from regular use of roads, non-maintenance of roads and culverts, and road failure. Sediment and debris from large-scale road failures may fill or otherwise degrade downstream wetlands.

Roads in forested habitats can increase sediment erosion and the risk of mass wasting, which can deliver fine and coarse sediment to surface waters (see Section 3.2.3, Environmental Effects to Water Resources). The presence of fine sediments reduces instream habitat quality for torrent salamanders by filling interstitial spaces critical for movement, egg deposition, and larval development (Corn and Bury, 1989; Diller and Wallace, 1996). Tailed frogs have also demonstrated sensitivity to increased levels of fine sediment, which may reduce cover and foraging area by filling interstitial spaces in the instream substrate (Bury and Corn, 1988) and also reduce the availability of algae and other foods important to tadpoles (Welsh and Ollivier, 1998).

3.6.3.2 Comparison of Alternatives

DNR's regulatory authority would not change under any of the alternatives. The alternatives differ with regard to the process by which the need for road repairs may be identified and addressed. Effects related to the repair of fish passage barriers are not addressed here, because tailed frogs and torrent salamanders typically occur in the upper, non-fish bearing reaches of streams. Also, adults are capable of overland movement and therefore are not affected by barriers to travel within the stream channel.

Alternative 1 (2001 Rules)

The potential for small forest landowner roads to contribute excessive sediment to streams would be lower under Alternative 1 than under Alternatives 2 and 3, because all landowners would be required to assess their roads in an RMAP by July 1, 2006. For more detailed discussions, see the analyses of effects to water resources (Section 3.2.3), riparian areas (Section 3.3.3), and fish (Section 3.5.3).

Alternative 2 (SSHB 1095) and Alternative 3 (SSHB 1095 with Clarifications)

As described in Section 3.3.3 (Environmental Effects - Riparian Areas), Alternatives 2 and 3 differ from Alternative 1 because of the process in which ongoing and potential road-related problems would be identified and addressed. Small forest landowners would only be required to prepare a Checklist RMAP, which calls for a lower level of detail than in an

RMAP. Small forest landowners would also be required to submit Checklist RMAPs under Alternatives 2 and 3 only if they submit an FPA/N for timber harvest. In addition, the 80/20 landowners would not be required to prepare RMAPs (Checklist or otherwise). Thus, under Alternatives 2 and 3, fewer landowners would be required to evaluate their forest roads for actual or potential damage to public resources, not all the evaluations would need to be completed before July 1, 2006, and the level of scrutiny would be lower than under Alternative 1. As a result, some potential forest road-related problems (i.e., roads with an elevated risk of contributing sediment to streams) may go undetected for a longer amount of time. Such roads may also pose a higher risk of failure, with attendant impacts to stream stability and water quality (see Section 3.2.3, Environmental Effects - Water Resources). As such, Alternatives 2 and 3 would pose a higher risk of adverse impacts to tailed frogs and torrent salamanders.

All Alternatives

The total amount of in-stream culvert replacement work would be nearly identical under all alternatives, because they do not differ with regard to the requirement that culverts must be adequately sized and fish passage barriers removed. The timeline for improvements, however, would differ under Alternatives 2 and 3 compared to Alternative 1, because some projects for landowners who participate in the FFFPP would be expected to occur after 2016.

To the extent that repair work occurs within or adjacent to streams, construction machinery and activities associated with road maintenance and abandonment may also contribute sediment to streams. The risk of any resultant adverse effects would be minimized, however, by following state laws and the forest practices rules.

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The following discusses the potential for significant adverse cumulative impacts of the proposed alternatives on water resources, riparian areas, fish, wetlands, and wildlife.

3.7.1 Water Resources

Many factors beyond the control of small forest landowners impact water resources. These include forestry practices on other forest lands, urbanization, residential development and use, agricultural practices, transportation routes, and utility corridors. These factors impact water resources by increasing runoff, sediment yield and sediment delivery. When combined with similar impacts from small forest landowner roads, they degrade public water resources.

An analysis of the increased cumulative risk of runoff-related sediment delivery to streams and wetlands under Alternatives 2 and 3 requires consideration of all lands available for timber management – that is, lands subject to the Washington forest practices rules, as well as federal and tribal forest lands. Small forest landowners own approximately 26 percent of the lands subject to the forest practices rules. But the percentage of small forest landowner lands is approximately 18 percent when all lands available for timber management are taken into consideration (Krug, 2005, Table 4: NMFS and USFWS, 2005, Table 3-3). The cumulative effects of Alternatives 2 and 3, when compared to all lands available for timber management, are only likely to be significant for specific problem sites and streams that they deliver to.

3.7.2 Riparian Areas and Fish

As described above, it is estimated that approximately 26 percent of the lands subject to the forest practices rules may be owned by small forest landowners and approximately 18 percent when all lands available for timber management are taken into consideration (Krug, 2005, Table 4: NMFS and USFWS, 2005, Table 3-3). Also, as described in Section 3.5.2.2 Aquatic Ecosystem, Habitat Components, as much as 20 percent of the fish passage barriers in Washington State may occur on small forest landowner properties (Krug, 2005). These estimates were based on limited information and consequently broad assumptions (D. Krug, personal communication August 26, 2005).

These relatively high percentages suggest that the reporting standards, simplified RMAP process, and schedule under Alternatives 2 and 3 could have substantial cumulative adverse effects on riparian areas and fish resources if the goals described in WAC 222-24-010 are not met. However, Alternatives 2 and 3 mitigate these potential effects by including check-in points with the legislature in 2008 and 2013 to evaluate the progress of the small forest landowner RMAP process towards meeting the 2016 goal. It is expected that corrective action would occur if progress is not satisfactory.

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Numerous other entities including state, federal, local, and tribal agencies, plus non-profit conservation groups, are working to address factors that adversely affect fish in Washington State. Many of these entities, such as the FFFPP described above, Water Resource Inventory Area groups, the U.S. Forest Service, and the WDFW are working cooperatively to identify fish passage barriers and locate funding to fix them. However funding sources are limited. Many state, county, and local agencies responsible for roads as part of the transportation system are also funding the identification and repair of fish passage barriers in their jurisdictions. Under Alternative 1, small forest landowners are required to fix fish passage barriers by 2016. Under Alternatives 2 and 3, small forest landowners are relieved of at least some of this financial burden by applying to the FFFPP

3.7.3 Wetlands

The potential for additional long-term detrimental effects to wetlands is minimal for each alternative because forest roads must be maintained to prevent damage to public resources, and DNR may require any forest landowner to fix forest roads that cause or have the potential to cause damage to public resources. However, unforeseen future road problems may still occur on forest roads crossing wetlands, resulting in small site-specific losses of wetland area and/or reduction in function. As noted above, the removal of reporting requirements, the simplified RMAP process, and road work scheduling under Alternatives 2 and 3 could have substantial cumulative adverse effects in Washington if small forest landowners do not meet the goals described in WAC 222-24-010.

3.7.4 Wildlife

Cumulative effects on tailed frogs and torrent salamanders would be similar to those described in the Water Resources and Riparian Areas and Fish sections, above. Alternatives 2 and 3 have the potential for substantial cumulative adverse effects on water quality and thus habitat quality for stream-dwelling amphibians. This potential would be offset by the 2008 and 2013 check-in dates for evaluation of progress toward the stated goal of repairing all road problems.

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5. GLOSSARY

80/20 landowners	Small forest landowners who own a total of 80 acres or less of forest land in Washington State. They are not required to submit an RMAP for any block of forest land that contains 20 contiguous acres or less.
Anadromous fish	Those species of fish that mature in the ocean and migrate to freshwater streams to spawn; an example is salmon.
Best management practices (BMPs)	Practices used for the protection of water quality, wildlife, and riparian resources. BMPs are designed to prevent potential or actual road related resource damage. BMPs are standards to be achieved, not detailed or site-specific prescriptions or solutions.
Bog	A wetland that has the following two characteristics: hydric organic soils (peat and/or muck), typically 16 inches or more in depth (except over bedrock or hardpan), and vegetation such as sphagnum moss, Labrador tea, bog laurel, bog rosemary, sundews, and sedges; bogs may have an overstory of spruce, western hemlock, lodgepole pine, western redcedar, western white pine, Oregon crabapple, or quaking aspen, and may be associated with open water. This includes nutrient-poor fens.
Buffer	A forested strip left during timber harvest to conserve sensitive ecosystems, riparian areas, or wildlife habitat.
Coarse sediment	Particles that are typically considered coarse sand and are gravel-sized or larger; generally transported as bedload.
Code of Federal Regulations (CFR)	A codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government.
Debris flow	A moving mass of rock, soil, debris, and mud, with more than half the particles being larger than sand size; it can travel many miles down steep slopes or confined mountain channels; it is a form of debris torrent.
Debris torrent	Debris flow or dam-break flood. Rapid movement of a large quantity of materials, including wood and sediment, down a stream channel. It usually occurs in smaller streams during storms or floods and scours the stream bed in steeper channels.

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Drainage Structure	A construction technique or feature that is built to relieve surface runoff and/or intercepted ground water from roadside ditches to prevent excessive buildup in water volume and velocity. A drainage structure is not intended to carry any typed water. Drainage structures include structures such as cross drains, relief culverts, ditch diversions, water bars, or other such structures demonstrated to be equally effective.
Eastern Washington	The geographic area in Washington east of the crest of the Cascade Mountains from the international border to the top of Mt. Adams, then east of the ridge line dividing the White Salmon River drainage from the Lewis River drainage, and east of the ridge line dividing the Little White Salmon River drainage from the Wind River drainage, to the Washington-Oregon state line.
Eighty/twenty (80/20) landowners	Small forest landowners who own a total of 80 acres or less of forest land in Washington State. They are not required to submit an RMAP for any block of forest land that contains 20 contiguous acres or less.
Endangered Species Act (ESA)	The federal Endangered Species Act of 1973 (16 U.S.C. §1531 et. seq.), as amended, sets up processes by which plant and animal species can be designated as threatened or endangered. Two federal agencies, the USFWS and NOAA Fisheries, administer the act. Once species are listed, the act also provides that these agencies develop recovery plans for these species, including conserving the ecosystems on which listed species depend.
Environmental impact statement (EIS)	A document prepared under the National or State Environmental Policy Acts to assess the effects that a particular action or program will have on the environment.
Family Forest Fish Passage Program (FFPP)	A cost share program for small forest landowners.
Fine sediment	Particles that are typically medium sand-sized or smaller; generally transported as suspended and washload.
Fix (related to fish passage barriers)	The removal of a fish passage barrier and installation of new fish passable structure, such as a culvert or bridge.

Forest landowner	Any person in actual control of forest land, whether such control is based either on legal or equitable title, or on any other interest entitling the holder to sell or otherwise dispose of any or all of the timber on such land in any manner. However, any lessee or other person in possession of forest land without legal or equitable title to such land shall be excluded from the definition of "forest landowner" unless such lessee or other person has the right to sell or otherwise dispose of any or all of the timber located on such forest land.
Forest practices	Activities conducted on or directly pertaining to forest land and related to growing, harvesting, or processing timber, including but not limited to the following: road and trail construction; harvesting, final and intermediate; precommercial thinning; reforestation; fertilization; prevention and suppression of diseases and insects; salvage of trees; and brush control.
Forest Practices Act	A Washington State statute (chapter 76.09 RCW) establishing minimum standards for forest practices and providing for necessary administrative procedures and rules applicable to activities conducted on or pertaining to forests, on both state managed and private lands.
Forest Practices Board (FPB)	A Washington State agency created by the Forest Practices Act to adopt forest practices rules that protect public resources coincident with the maintenance of a viable forest products industry. These rules are administered and enforced by the Washington Department of Natural Resources.
Forest Practices Rules	Title 222 of the WAC. These rules give direction on how to implement the Forest Practices Act (chapter 76.09 RCW) and Stewardship of Non-industrial Forests and Woodlands (chapter 76.13 RCW).
Forest Road	A road on forest land used since 1974 for forest practices. It does not include skid trails, highways or county roads except where the county is a forest landowner or operator. (WAC 222-16-010)
Forested wetland	Any wetland or portion thereof that has (or if the trees were mature would have) a crown closure of 30 percent or more.
Geographic information system (GIS)	A computer system that stores and manipulates spatial data and can produce a variety of maps and analyses. DNR's GIS is able to (1) assign information and attributes to polygons and lines, which represent relationships on the ground, and (2) update and retrieve inventory, mapping, and statistical information. DNR uses its GIS as one of several tools for setting landscape-level planning objectives.
Habitat conservation plan (HCP)	An implementable program for the long-term protection and benefit of a species in a defined area; required as part of a Section 10 incidental taking permit application under the federal Endangered Species Act.

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Industrial forest landowners	As identified in RTI data, individual ownerships greater than 5,000 acres and directly associated with wood processing or handling facilities.
Interception	In hydrology, the rain and snow caught in the forest canopy.
Landslide	Any mass movement process characterized by downslope transport of soil and rock, under gravitational stress, by sliding over a discrete failure surface, or the resultant landform. In forested watersheds, landsliding typically occurs when local changes in the pore-water pressure increase to a degree that the friction between particles is inadequate to hold the mass on the slope.
Large woody debris (LWD)	Generally, large pieces of wood in stream channels, including logs, pieces of logs, and large chunks of wood; LWD provides streambed stability and/or habitat complexity. The Forest Practices Board Manual defines LWD as pieces greater than 4 inches in diameter and greater than 1.5 times the bankfull width in length.
Mass wasting	Dislodgment and downslope transport of soil and rock under the direct application of gravitational stress.
National Marine Fisheries Service (NMFS)	The federal agency that is the listing authority for marine mammals and anadromous fish under the federal Endangered Species Act.
Nonforested wetland	Any wetland or portion thereof that has (or if the trees were mature would have) a crown closure of less than 30 percent. There are two types of nonforested wetlands. A Type A Wetland is (1) greater than 0.5 acre in size; (2) associated with at least 0.5 acre of ponded or standing open water; or (3) are bogs and fens greater than 0.25 acre. All other nonforested wetlands greater than 0.25 acre are Type B wetlands.
Public resource	Per WAC 222-16-010, water, fish and wildlife, as well as capital improvements of the state or its political subdivisions.
Relief culvert	A type of cross drain used to divert water from the ditch to the forest floor on the other side of the road. Also referred to as a ditch relief culvert.
Riparian area	Areas of land directly influenced by water or that influence water. Riparian areas usually have visible vegetative or physical characteristics reflecting the influence of water. Riversides and lake shores are typical riparian areas.
Riparian function	Riparian function includes bank stability, the recruitment of LWD, leaf litter fall, nutrients, sediment filtering, shade, and other riparian features that are important to both riparian forest and aquatic systems conditions.
Road	See forest road.

Road abandonment	As defined in WAC 222-24-052(3), a process that includes (a) outsloping, water barring, and otherwise leaving the road in a condition suitable to control erosion and maintain water movement within wetlands and natural drainages, (b) leaving ditches in a suitable condition to reduce erosion, (c) blocking the road so that four wheel highway vehicles cannot pass the point of closure at the time of abandonment, (d) removing water crossing structures and fills on all typed waters, except where the DNR determines other measures would provide protection to public resources, and (e) receiving a DNR determination that the road has been abandoned according to the above procedures. Roads are exempt from maintenance only after the final step (e) is completed.
Road prism	The cross section of the road, including the traveled surface, ditch, cutbank, and fillslope.
Sediment yield	The amount of sediment eroded from the land and transported to low areas and surface waters.
Shallow groundwater	Ground water that is near to the surface that is accessible to vegetation and often is intercepted by road cuts.
Small Forest Landowner Office (SFLO)	An office within the Washington Department of Natural Resources that serves as a resource and focal point for small forest landowner concerns and policies. The mission of the SFLO is to promote the economic and ecological viability of small forest landowners and to develop policies that conserve Washington's privately owned non-industrial forests.
Stream-adjacent parallel road	A road in a riparian management zone with an alignment parallel to the stream. Included are stream crossings where the alignment of the road continues parallel to the stream for more than 250 feet on either side of the stream. Excluded are federal, state, county, or municipal roads that are not subject to forest practices rules, or roads of another adjacent landowner.
Turbidity	The relative lack of clarity of water, which may be affected by material in suspension.
U.S. Fish and Wildlife Service (USFWS)	The federal agency that is the listing authority for species other than marine mammals and anadromous fish under the federal Endangered Species Act.
Washington Administrative Code (WAC)	The compilation of all current, permanent rules of state agencies.
Watershed	The drainage basin contributing water, organic matter, dissolved nutrients, and sediments to a stream or lake.

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Watershed analysis	A systematic procedure for characterizing watershed and ecological processes to meet specific management objectives; provides a basis for resource management planning. In Washington, the assessment of a Watershed Assessment Unit completed under forest practices rules (Chapter 222-22 WAC).
Western Washington	The geographic area of Washington west of the Cascade crest and the drainages defined in “eastern Washington.”
Wetland	An area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions; includes swamps, bogs, fens, and similar areas.

PROPOSED RMAP RULE IMPLEMENTING SSHB 1095

PROPOSED RMAP RULE IMPLEMENTING SSHB 1095

WAC 222-16-010 *GENERAL DEFINITIONS.

(Only definitions changed in RMAP rule proposal are shown.)

“Fish passage barrier” means any artificial instream structure that impedes the free passage of fish.

“Forest land” means all land which is capable of supporting a merchantable stand of timber and is not being actively used for a use which is incompatible with timber growing. For road maintenance and abandonment planning and implementation for small forest landowners, “forest land” excludes any of the following:

- (a) Residential home sites. A residential home site may be up to five acres in size, and must have a fixed structure in use as a residence;
- (b) Cropfields, orchards, vineyards, pastures, feedlots, fish pens, and the land on which appurtenances necessary to the production, preparation, or sale of crops, fruit, dairy products, fish, and livestock exist.

“Forest land owner” means any person in actual control of forest land, whether such control is based either on legal or equitable title, or on any other interest entitling the holder to sell or otherwise dispose of any or all of the timber on such land in any manner. ~~Provided, That~~ However, any lessee or other person in possession of forest land without legal or equitable title to such land shall be excluded from the definition of "forest land owner" unless such lessee or other person has the right to sell or otherwise dispose of any or all of the timber located on such forest land.

- (1) “Large forest landowner,” for purposes of road maintenance and abandonment planning, means any forest landowner who is not a small forest landowner.
- (2) “Small forest landowner” is a forest landowner who at the time of submitting a forest practices application or notification:
 - (a) Has harvested from his or her own forest lands in Washington state no more than an average timber volume of two million board feet per year during the three years prior to submitting the forest practices application or notification to the department; and
 - (b) Certifies that he or she does not expect to harvest from his or her own forest lands in the state more than an average timber volume of two million board feet per year during the ten years following the submission of a forest practices application or notification to the department.
 - (c) A landowner who exceeded the harvest threshold as described above, or expects to exceed the harvest limits during any of the following ten years, will still be considered a “small forest landowner” if:
 - (i) He or she establishes to the department’s reasonable satisfaction that the harvest limits were or will be exceeded in order to raise funds to pay estate taxes; or

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(ii) There is an equally compelling and unexpected obligation, such as for a court-ordered judgment or for extraordinary medical expenses.

(d) For the purposes of the forestry riparian easement program, “small forest landowner” is defined in WAC 222-21-010 (13).

“Forest road” means ways, lanes, roads, or driveways on forest land used since 1974 for forest practices or forest management activities such as fire control. "Forest roads" does not include skid trails, highways, or county roads except where the county is a forest landowner or operator. “Forest road,” as it applies to road maintenance and abandonment planning for small forest landowners, means a road or road segment that crosses forest lands owned by the small forest landowner, but excludes portions of access roads to residential home sites not used as a part of a current forest practice involving harvest or salvage of trees.

WAC 222-20-010 APPLICATIONS AND NOTIFICATIONS - POLICY.

- (1) No Class II, III or IV forest practices shall be commenced or continued unless the department has received a notification for Class II forest practices, or approved an application for Class III or IV forest practices pursuant to the act. Where the time limit for the department to act on the application has expired, and none of the conditions in WAC 222-20-020(1) exist, the operation may commence. (NOTE: OTHER LAWS AND RULES AND/OR PERMIT REQUIREMENTS MAY APPLY. SEE CHAPTER 222-50 WAC.)
- (2) The department shall prescribe the form and contents of the notification and application, which shall specify what information is needed for a notification, and the information required for the department to approve or disapprove the application.
- (3) Except as provided in subpart (4) below, applications and notifications shall be signed by the landowner, the timber owner and the operator, or the operator and accompanied by a consent form signed by the timber owner and the landowner. A consent form may be another document if it is signed by the landowner(s) and it contains a statement acknowledging that he/she is familiar with the Forest Practices Act, including the provisions dealing with conversion to another use (RCW 76.09.060(3)).
- (4) In lieu of a landowner’s signature, where the timber rights have been transferred by deed to a perpetual owner who is different from the forest landowner, the owner of perpetual timber rights may sign a forest practices application or notification for operations not converting to another use and the statement of intent not to convert for a set period of time. The holder of perpetual timber rights shall serve the signed forest practices application or notification and the signed statement of intent on the forest landowner. The forest practices application shall not be considered complete until the holder of perpetual timber rights has submitted evidence acceptable to the department that such service has occurred.
- (5) Where an application for a conversion is not signed by the landowner or accompanied by a consent form, as outlined in subsection (3) of this section, the department shall not approve the application. Applications and notifications for the development or maintenance of utility rights of way shall not be considered to be conversions.

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- (6) Transfer of the approved application or notification to a new landowner, timber owner or operator requires written notice by the original landowner or applicant to the department and should include the original application or notification number. This written notice shall be in a form acceptable to the department and shall contain an affirmation signed by the new landowner, timber owner, or operator, as applicable, that he/she agrees to be bound by all conditions on the approved application or notification. In the case of a transfer of an application previously approved without the landowner's signature the new timber owner or operator must submit a bond securing compliance with the requirements of the forest practices rules as determined necessary by the department. If an application or notification indicates that the landowner or timber owner is also the operator, or an operator signed the application, no notice need be given regarding any change in subcontractors or similar independent contractors working under the supervision of the operator of record.
- (7) Applications and notifications must be delivered to the department at the appropriate region office. Delivery should be in person or by registered or certified mail.
- (8) Applications and notifications shall be considered received on the date and time shown on any registered or certified mail receipt, or the written receipt given at the time of personal delivery, or at the time of receipt by general mail delivery. Applications or notifications that are not complete, or are inaccurate will not be considered officially received until the applicant furnishes the necessary information to complete the application.
- (a) A **review statement** from the U.S. Forest Service that evaluates compliance of the forest practices with the CRGNSA special management area guidelines is necessary information for an application or notification within the CRGNSA special management area. The review statement requirement shall be waived if the applicant can demonstrate the U.S. Forest Service received a complete plan application and failed to act within 45 days.
- (b) An **environmental checklist** (WAC 197-11-315) is necessary information for all Class IV applications. (c) A local governmental entity clearing and/or grading permit is necessary information for all Class IV applications on lands that have been or will be converted to a use other than commercial timber production or on lands which have been platted after January 1, 1960, as provided in chapter 58.17 RCW, if the local governmental entity has jurisdiction and has an ordinance requiring such permit.
- (d) A road maintenance and abandonment plan as described in WAC 222-24-0511 shall be submitted with a small forest landowner's application or notification for harvest or salvage of trees, unless exempt under WAC 222-24-0512.
- If a notification or application is delivered in person to the department by the operator or the operator's authorized agent, the department shall immediately provide a dated receipt. In all other cases, the department shall immediately mail a dated receipt to the applicant.
- (9) An **operator's name**, if known, must be included on any forest practices application or notification. The landowner or timber owner must provide notice of hiring or

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change of operator to the department within 48 hours. The department shall promptly notify the landowner if the operator is subject to a notice of intent to disapprove under WAC 222-46-070. Once notified, the landowner will not permit the operator, who is subject to a notice of intent to disapprove, to conduct the forest practices specified in the application or notification, or any other forest practices until such notice of intent to disapprove is removed by the department.

- (10) **Financial assurances** may be required by the department prior to the approval of any future forest practices application or notification to an operator or landowner under the provisions of WAC 222-46-090.

WAC 222-20-015 MULTIYEAR PERMITS.

- (1) Where a watershed analysis has been approved for a WAU under WAC 222-22-080, landowner(s) may apply for a multiyear permit. The information provided and level of detail must be comparable to that required for a two-year permit. At a minimum, the application must include:
 - (a) A description of the forest practices to be conducted during the period requested for the permit, and a map(s) showing their locations; and
 - (b) Prescriptions must be identified where operations are proposed within or include areas of resource sensitivity.
- (2) A landowner may apply for a multiyear permit to perform road maintenance or abandonment if the landowner has an approved road maintenance and abandonment plan where the schedule for implementing the plan is longer than two years. The information provided and level of detail must be comparable to that required for two-year permits under WAC 222-24-050. A checklist road maintenance and abandonment plan does not qualify for a multiyear permit.
- (3) A landowner may apply for a multiyear permit to perform an approved alternate plan.

WAC 222-20-040 APPROVAL CONDITIONS.

- (1) Whenever an approved application authorizes a forest practice which, because of soil condition, proximity to a water course or other unusual factor, has a potential for causing material damage to a public resource, as determined by the department, the applicant shall, when requested on the approved application, notify the department 2 business days before the commencement of actual operations.
- (2) **All approvals** are subject to any conditions stipulated on the approved application and to any subsequent additional requirements set forth in a stop work order or a notice to comply.
- (3) **Local governmental entity conditions.**
 - (a) **RCW 76.09.240(4)** allows a local governmental entity to exercise limited land use planning or zoning authority on certain types of forest practices. This subsection is designed to ensure that local governmental entities exercise this authority consistent with chapter 76.09 RCW and the rules in Title 222 WAC. The system provided for in this subsection is optional.

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- (b) This subsection only applies to Class IV general applications on lands that have been or are being converted to a use other than commercial timber production or to Class IV general applications on lands which have been platted after January 1, 1960, as provided in chapter 58.17 RCW.
 - (c) The department shall transmit the applications to the appropriate local governmental entity within two business days from the date the department receives the application.
 - (d) The department shall condition the application consistent with the request of the local governmental entity if:
 - (i) The local governmental entity has adopted a clearing and/or grading ordinance that addresses the items listed in (e) of this subsection and requires a permit;
 - (ii) The local governmental entity has issued a permit under the ordinance in (i) that contains the requested conditions; and
 - (iii) The local governmental entity has entered into an interagency agreement with the department consistent with WAC 222-50-030 addressing enforcement of forest practices.
 - (e) The local governmental entity conditions may only cover:
 - (i) The location and character of open space and/or vegetative buffers;
 - (ii) The location and design of roads;
 - (iii) The retention of trees for bank stabilization, erosion prevention, and/or storm water management; or
 - (iv) The protection of critical areas designated pursuant to chapter 36.70A RCW.
 - (f) Local governmental entity conditions shall be filed with the department within twenty-nine days of the filing of the application with the department or within fourteen business days of the transmittal of the application to the local governmental entity or one day before the department acts on the application, whichever is later.
 - (g) The department shall incorporate local governmental entity conditions consistent with this subsection as conditions of the forest practices approval.
 - (h) Any exercise of local governmental entity authority consistent with this subsection shall be considered consistent with the forest practices rules in this chapter.
- (4) **Lead agency mitigation measures.**
- (a) This subsection is designed to specify procedures for a mitigated DNS process that are consistent with chapters 76.09 and 43.21C RCW and the rules in Title 222 WAC and chapter 197-11 WAC.
 - (b) This subsection applies to all Class IV applications in which the department is not the lead agency under SEPA. (See WAC 197-11-758.)

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- (c) The department shall transmit the application to the lead agency within two business days from the date the department receives the application.
- (d) The lead agency may specify mitigation measures pursuant to WAC 197-11-350.
- (e) The lead agency threshold determination and any mitigation measures must be filed with the department within the later of (i) twenty-nine days of the receipt of the application by the department, (ii) fourteen business days of the transmittal of the application to the lead agency if the lead agency is a local governmental entity; or (iii) one day before the department acts on the application.
- (f) Unless the applicant clarifies or changes the application to include mitigation measures specified by the lead agency, the department must deny the application or require an EIS. (See WAC 197-11-738.)
- (g) If the department does not receive a threshold determination from the lead agency by the time it must act on the application, the department shall deny the application.

(5) Small forest landowner approval conditions.

- (a) The department shall not disapprove a forest practices application or notification filed by a small forest landowner solely on the basis that fish passage barriers have not been removed, replaced or repaired if:
 - (i) The landowner will remove, replace or repair fish passage barriers on the forest roads covered or affected by the forest practices application or notification, during the term of the forest practices application or notification; or
 - (ii) The landowner commits to the state led cost share program to remove, replace or repair all fish passage barriers on the forest roads covered or affected by the forest practices application or notification and the landowner's fish passage barriers are lower on the priority list for funding than current projects funded by the program.
- (b) The department may disapprove applications or notifications for harvest or salvage of trees, or take any enforcement action deemed necessary, to replace, remove or repair the fish passage barriers of small forest landowners who previously committed to:
 - (i) Participate in the cost share program, but failed to remove, replace or repair the fish passage barriers on their own lands when cost share funding became available; or
 - (ii) Remove, replace or repair fish passage barriers on their own lands as an identified part of a forest practice application but failed to do so.

(6) **CRGNSA special management area.**

- (a) Policy. The states of Oregon and Washington have entered into a Compact preauthorized by Congress to implement the CRGNSA Act, 16 U.S.C. §§ 544, et seq. chapter 43.97 RCW, 16 U.S.C. § 544c. The purposes of the CRGNSA Act are:
- (i) To establish a national scenic area to protect and provide for the enhancement of the scenic, cultural, recreational, and natural resources of the Columbia River Gorge; and
 - (ii) To protect and support the economy of the Columbia River Gorge area by encouraging growth to occur in existing urban areas and by allowing future economic development in a manner that is consistent with paragraph (1). 16 U.S.C. § 544a.

The forest practices rules addressing forest practices in the CRGNSA special management area recognize the intent of Congress and the states expressed in the CRGNSA Act and Compact and the intent of the Washington state legislature in the Forest Practices Act. These rules are designed to recognize the public interest in sound natural resource protection provided by the Act and the Compact, including the protection to public resources, recreation, and scenic beauty. These rules are designed to achieve a comprehensive system of laws and rules for forest practices in the CRGNSA special management area which avoids unnecessary duplication, provides for interagency input and intergovernmental and tribal coordination and cooperation, considers reasonable land use planning goals contained in the CRGNSA management plan, and fosters cooperation among public resources managers, forest landowners, tribes and the citizens.

- (b) The CRGNSA special management area guidelines shall apply to all forest practices within the CRGNSA special management area. Other forest practices rules also apply to these forest practices. To the extent these other rules are inconsistent with the guidelines, the more restrictive requirement controls. To the extent there is an incompatibility between the guidelines and another rule, the guidelines control. Copies of the guidelines can be obtained from the department Southeast and Southwest regional offices and Olympia office, as well as from the Columbia River Gorge commission and the U.S. Forest Service.
- (c) The department shall review and consider the U.S. Forest Service review statement and shall consult with the U.S. Forest Service and the Columbia River Gorge commission prior to making any determination on an application or notification within the CRGNSA special management area.

WAC 222-20-055

Continuing forest land obligations. Continuing forest land obligations include reforestation, road maintenance and abandonment plans, and harvest strategies on perennial nonfish habitat waters in Eastern Washington.

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- (1) Prior to the sale or transfer of land or perpetual timber rights subject to continuing forest land obligations under the Forest Practices Act and rules, the seller must notify the buyer of the existence and nature of such a continuing obligation and the buyer must sign a notice of continuing forest land obligation indicating the buyer's knowledge of the obligations. The notice must be:
 - (a) On a form prepared by the department;
 - (b) Sent to the department by the seller at the time of sale or transfer of land or perpetual timber rights; and
 - (c) Retained by the department.
- (2) If the seller fails to notify the buyer about the continuing forest land obligation, the seller must pay the buyer's costs related to continuing forest land obligations, including all legal costs and reasonable attorneys' fees incurred by the buyer in enforcing the continuing forest land obligation against the seller.
- (3) Failure by the seller to send the required notice to the department at the time of sale will be prima facie evidence in an action by the buyer against the seller for costs related to the continuing forest land obligation prior to sale.
- (4) Small forest landowner checklist road maintenance and abandonment plans are exempt from the notice requirements of this section.

WAC 222-24-010 POLICY.

- * (1) A well designed, located, constructed, and maintained system of forest roads is essential to forest management and protection of the public resources. Riparian areas contain some of the more productive conditions for growing timber, are heavily used by wildlife and provide essential habitat for fish and wildlife and essential functions in the protection of water quality. Wetland areas serve several significant functions in addition to timber production: Providing fish and wildlife habitat, protecting water quality, moderating and preserving water quantity. Wetlands may also contain unique or rare ecological systems.
- * (2) To protect water quality and riparian habitat, roads must be constructed and maintained in a manner that will prevent potential or actual damage to public resources. This will be accomplished by constructing and maintaining roads so as not to result in the delivery of sediment and surface water to any typed water in amounts, at times or by means, that preclude achieving desired fish habitat and water quality by:
 - Providing for fish passage at all life stages (see Washington state department of fish and wildlife hydraulic code Title 220 WAC);
 - Preventing mass wasting;
 - Limiting delivery of sediment and surface runoff to all typed waters;
 - Avoiding capture and redirection of surface or ground water. This includes retaining streams in their natural drainages and routing subsurface flow captured by roads and road ditches back onto the forest floor;
 - Diverting most road runoff to the forest floor;

- Providing for the passage of some woody debris;
- Protecting stream bank stability;
- Minimizing the construction of new roads; and
- Assuring that there is no net loss of wetland function.

The road construction and maintenance rules in this chapter must be applied in achieving these goals. The strategies for achieving the goals for road maintenance outlined in this chapter are expected to be completed by December 2016. Additional guidance is identified in the board manual, section 3. If these goals are not achieved using the rules and the applied guidance, additional management strategies must be employed.

- * (3) Extra protection is required during road construction and maintenance to protect public resources and timber growing potential. Landowners and fisheries and wildlife managers are encouraged to cooperate in the development of road management and abandonment plans. Landowners are further encouraged to cooperate in sharing roads to minimize road mileage and avoid duplicative road construction.
- * (4) This section covers the location, design, construction, maintenance and abandonment of forest roads, bridges, stream crossings, quarries, borrow pits, and disposal sites used for forest road construction and is intended to assist landowners in proper road planning, construction and maintenance so as to protect public resources.

(**Note:** Other laws and rules and/or permit requirements may apply. See chapter 222-50 WAC.)

WAC 222-24-050

***Road maintenance and abandonment.** The goals for road maintenance are established in WAC 222-24-010; all forest roads must be maintained to prevent potential or actual damage to public resources. Fish passage must be addressed by December 2016. Replacement will not be required for existing culverts functioning with little risk to public resources or for culverts that were installed under an approved forest practices application or notification, and are capable of passing fish, until the end of the culvert's functional life.

- (1) All forest roads on lands owned by large forest landowners must be improved and maintained to the standards of this chapter within 15 years of the effective date of these rules. Guidelines for how to meet these goals and standards are in the board manual, section 3. Work performed toward meeting the standards must generally be even flow over the 15-year period with priorities for achieving the most benefit to public resources early in the period. ~~Replacement will not be required for existing culverts functioning with little risk to public resources or for culverts installed under an approved forest practices application or notification if they have been properly maintained and are capable of passing fish, until the end of the culvert's functional life.~~
- (2) Forest roads used as part of any forest practices applications or notifications on lands owned by small forest landowners must be maintained only to the extent necessary to prevent damage to public resources. Fish passage barriers on small forest

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landowner properties will be addressed through a watershed based assessment focused on a priority of fixing the worst barriers first.

(a) A cost share program administered by the department is available to assist small forest landowners with the removal, replacement, or repair of fish passage barriers that were installed prior to May 14, 2003. The cost share program includes limits on landowner costs and the opportunity for in-kind contributions. If an existing fish passage barrier on land owned by a small forest landowner was installed under an approved forest practices application or notification, and hydraulics approval, and that fish passage barrier becomes a high priority for fish passage based on watershed ranking, one hundred percent public funding shall be provided as provided in chapter 76.13 RCW.

(b) Small forest landowners who have committed to participate in the state led cost share program are not required to remove, replace or repair fish passage barriers until cost share funding is available and higher priority fish passage barriers on other lands in the watershed have been removed or funded.

(c) A small forest landowner not participating in the state led cost share program must remove, replace or repair any fish passage barriers on the forest roads within their ownership covered or affected by an active forest practices application or notification for harvest or salvage of trees.

(d) The department, in consultation with the department of fish and wildlife, shall monitor the effectiveness of the checklist road maintenance and abandonment plan approach described in WAC 222-24-0511, and state-led cost share program, and report to the board by December 31 of both 2008 and 2013 on the accomplishments with respect to having road maintenance and fish passage addressed by 2016.

(3) If any landowner is notified by the department that their road(s) has the potential to damage public resources, the landowner must, within 90 days, submit to the department for review and approval a compliance schedule of work to address the problems identified by the department.

WAC 222-24-051 *LARGE FOREST LANDOWNER ROAD MAINTENANCE SCHEDULE.

All forest roads must be covered under an approved road maintenance and abandonment plan within 5 years of the effective date of this rule or by December 31, 2005. This includes all roads that were constructed or used for forest practices after 1974. Inventory and assessment of orphan roads must be included in the road maintenance and abandonment plans as specified in WAC 222-24-052(4).

*(1) Large forest landowners with 500 acres or more of forest land in a DNR region must maintain a schedule of submitting plans to the department that cover 20% of their roads or land base each year.

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~~Landowners with less than 500 acres of forest land in a DNR region must submit with their first forest practices application or notification a road maintenance and abandonment plan covering the roads that will be used by the application. Within one year of the date of submittal of the first forest practices application or notification or before the end of 2005, whichever comes first, the landowner must submit a road maintenance and abandonment plan for the rest of their ownership in that region. Once the plan is approved, the landowner must attach or reference the approved road maintenance and abandonment plan when submitting subsequent applications.~~

- (2) For those portions of their ownership that fall within a watershed administrative unit covered by an approved watershed analysis plan, chapter 222-22 WAC, landowners may follow the watershed administrative unit-road maintenance plan, providing the roads they own are covered by the plan. A proposal to update the road plan to meet the current road maintenance standards must be submitted to the department for review on or before the next scheduled road maintenance plan review. If annual reviews are not required as part of the watershed analysis road plan, the plan must be updated by October 1, 2005. All roads in the planning area must be in compliance with the current rules by the end of calendar year 2015. See the board manual section 3 for road maintenance and abandonment plan outline.
- * (3) Plans will be submitted by landowners on a priority basis. Road systems or drainages in which improvement, abandonment or maintenance have the highest potential benefit to the public resource are the highest priority. Based upon a “worst first” principle, work on roads that affect the following are presumed to be the highest priority:
 - (a) Basins containing, or road systems potentially affecting, waters which either contain a listed threatened or endangered fish species under the federal or state law or a water body listed on the current 303(d) water quality impaired list for road related issues.
 - (b) Basins containing, or road systems potentially affecting, sensitive geology/soils areas with a history of slope failures.
 - (c) Road systems or basins where other restoration projects are in progress or may be planned coincident to the implementation of the proposed road plan.
 - (d) Road systems or basins likely to have the highest use in connection with future forest practices.
- * (4) Based upon a “worst first” principle, road maintenance and abandonment plans must pay particular attention to:
 - (a) Roads that block fish passage;
 - (b) Roads that deliver sediment to typed water;
 - (c) Roads with evidence of existing or potential instability that could adversely affect public resources;
 - (d) Roads or ditchlines that intercept ground water; and

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(e) Roads or ditches that deliver surface water to any typed waters.

* (5) Road maintenance and abandonment plans must include:

- (a) Ownership maps showing all forest roads, including orphan roads; planned and potential abandonment, all typed water, Type A and B Wetlands that are adjacent to or crossed by roads, stream adjacent parallel roads and an inventory of the existing condition; and
- (b) Detailed description of the first years work with a schedule to complete the entire plan within fifteen years; and
- (c) Standard practices for routine road maintenance; and
- (d) Storm maintenance strategy that includes prestorm planning, emergency maintenance and post storm recovery; and
- (e) Inventory and assessment of the risk to public resources or public safety of orphaned roads; and
- (f) The landowner or landowner representative's signature.

* (6) Priorities for road maintenance work within plans are:

- (a) Removing blockages to fish passage beginning on roads affecting the most habitat first, generally starting at the bottom of the basin and working upstream;
- (b) Preventing or limiting sediment delivery (areas where sediment delivery or mass wasting will most likely affect bull trout habitat will be given the highest priority);
- (c) Correcting drainage or unstable sidecast in areas where mass wasting could deliver to public resources or threaten public safety;
- (d) Disconnecting road drainage from typed waters;
- (e) Repairing or maintaining stream-adjacent parallel roads with an emphasis on minimizing or eliminating water and sediment delivery;
- (f) Improving hydrologic connectivity by minimizing the interruption of surface water drainage, interception of subsurface water, and pirating of water from one basin to another; and
- (g) Repair or maintenance work which can be undertaken with the maximum operational efficiency.

* (7) Initial plans for large forest landowners ~~with 500 acres or more of forest land in a DNR region~~ must be submitted to the department during the year 2001 as scheduled by the department.

* (8) Each year on the anniversary date of the plan's submittal, landowners must report work accomplished for the previous year and submit to the department a detailed description of the upcoming year's work including modifications to the existing work schedule.

The department's review and approval will be conducted in consultation with the department of ecology, the department of fish and wildlife, affected tribes and interested parties. The department will:

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- (a) Review the progress of the plans annually with the landowner to determine if the plan is being implemented as approved; and
- (b) The plan will be reviewed by the department and approved or returned to the applicant with concerns that need to be addressed within forty-five days of the plan's submittal.
- (c) Additional plans will be signed by the landowner or the landowner's representative.

*((9)) The department will facilitate an annual water resource inventory area (WRIA) meeting with landowners, the department of fish and wildlife, the department of ecology, affected tribes, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, affected counties, local U.S. Forest Service, watershed councils, and other interested parties. The purpose of the meeting is to:

- (a) Suggest priorities for road maintenance and abandonment planning; and
- (b) Exchange information on road maintenance and stream restoration projects.

*((10)) A forest practices application with a detailed one to five year work plan associated with a submitted road maintenance and abandonment plan will be treated as a multiyear permit. The application will be reviewed, approved, conditioned and/or disapproved within 45 days of acceptance. The application will be reviewed in consultation with the department of ecology, department of fish and wildlife, affected tribes and interested parties.

*((11)) Regardless of the schedule for plan development, roads that are currently used or proposed to be used for timber hauling must be maintained in a condition that prevents potential or actual damage to public resources. If the department determines that log haul on such a road will cause or has the potential to cause material damage to a public resource, the department may require the applicant to submit a plan to address specific issues or segments on the haul route.

*((12)) If a landowner is found to be out of compliance with the work schedule of an approved road maintenance and abandonment plan and the department determines that this work is necessary to prevent potential or actual damage to public resources, then the department will exercise its authority under WAC 222-46-030 (notice to comply) and WAC 222-46-040 (stop work order) to restrict use of the affected road segment.

- (a) The landowner may submit a revised maintenance plan for maintenance and abandonment and request permission to use the road for log haul.
- (b) The department must approve use of the road if the revised maintenance plan provides protection of the public resource and maintains the overall schedule of maintenance of the road system or basin.

*((13)) If a landowner is notified by the department that their road(s) has the potential to damage public resources, the landowner must, within 90 days, submit to the department for review and approval a plan or plans for those drainages or road systems within the area identified by the department.

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NEW SECTION

WAC 222-24-0511 SMALL FOREST LANDOWNER ROAD MAINTENANCE PLANNING.

- (1) Small forest landowners other than those described in WAC 222-24-0512, must follow either of the options in (a) or (b) of this subsection when submitting a forest practices application or notification for harvest or salvage of trees, unless (c) of this subsection applies.
 - (a) Small forest landowners must submit with each forest practices application or notification a checklist road maintenance and abandonment plan for the forest roads covered or affected by the forest practices activity. A small forest landowner may, at any time, submit a checklist road maintenance and abandonment plan for their entire ownership.
 - (b) Small forest landowners must submit for approval road maintenance and abandonment plans as outlined in WAC 222-24-051. Approved road maintenance and abandonment plans must be attached to or referenced in subsequent forest practices applications or notifications.
 - (c) For those portions of their ownership that fall within a watershed administrative unit covered by an approved watershed analysis plan, chapter 222-22 WAC, small forest landowners may follow the watershed administrative unit-road maintenance plan, providing the roads they own are covered by the plan.
- (2) A small forest landowner is not required to submit an annual report as described in WAC 222-24-051(8).
- (3) Small forest landowners who have committed to participate in the cost share program are not required to remove, replace or repair fish passage barriers until funding is available and higher priority fish passage barriers on other lands in the watershed have been removed or funded.
- (4) Forest roads that are being used or proposed to be used for timber hauling must be maintained in a condition that prevents damage to public resources. If the department determines that use of such a road will cause or has the potential to cause damage to a public resource, the department may require the applicant to submit a compliance schedule of work to address the problem(s) identified by the department.

NEW SECTION

WAC 222-24-0512

Forest landowners exempted from road maintenance and abandonment planning. Forest landowners owning 80 acres or less of forest land in Washington who are submitting a forest practices application or notification for a block of forest land that is 20 contiguous acres or less in area are not required to submit either a checklist road maintenance and abandonment plan or a road maintenance and abandonment plan.

LARGE FOREST LANDOWNER RMAP

Implementing Road Maintenance and Abandonment (RMAP) Rules

RCW 76.09.370

Introduction:

The Forest Practices Board passed significant changes and additions to the road construction and maintenance WACs, through emergency rules, effective March 20, 2000. These changes are designed to ensure that forest roads in the State of Washington meet the landmark public resource protection policy goals and direction contained within the Salmon Recovery Act of 1999, and the Forests and Fish Report dated April 29, 1999. As stated in WAC 222-24-010, "A well designed, located, constructed, and maintained system of forest roads is essential to forest management and protection of the public resources."

Specifically, WAC 222-24-050 requires that all forest roads be improved and maintained to the standards of the rules by 2015. A new section, WAC 222-24-051, was added to the forest practices rules to provide direction on how forest road maintenance and abandonment will be planned and conducted to achieve that goal. Forest landowners in the State of Washington are now required to have all forest roads under a road maintenance and abandonment plan (RMAP) by the end of 2005, and they must have all necessary road repairs, reconstruction, upgrades, and maintenance completed by the end of 2015. Large forest landowners (LFLOs) with 500 acres or more of forest land must maintain a schedule of submitting RMAPs to the Department of Natural Resources (DNR) that generally cover 20% of their roads each year. Landowners with less than 500 acres of forest land in a DNR region must submit a RMAP covering their entire ownership within the DNR region prior to, or concurrently with a forest practice notification or application for road construction or harvest activities.

DNR will approve the schedule of when RMAPs will be submitted by LFLOs. And each year on the anniversary date of the plan submittal, landowners must report work accomplishments for the previous year and submit plan modifications. The DNR review and approval of these annual reports will be conducted in consultation with the Department of Ecology, the Department of Fish and Wildlife, affected tribes, and interested parties.

Because the size and types of forest land ownerships vary considerably across the state, the amount of detail of required information and number of road maintenance and abandonment plans submitted to DNR will vary by landowner. Landowners with very small ownerships will probably satisfy their RMAP requirements with one plan. Large landowners will likely enter into a more sophisticated, prioritized planning process involving ownership planning units called road management blocks (RMBs) and multiple RMAPs. The information below is intended to assist forest landowners (especially large landowners) with their required road maintenance and abandonment planning and implementation process. Outlined text applies to all forest landowners, including those owning less than 500 acres.

The RMAP Preparation, Submittal, Implementation, and Reporting Process:

Preparing and Submitting the Inventory Scheduling Proposal - WAC 222-24-051 (3)

- Determine the location and size of all forest land owned in Washington State by DNR Region.
- Allocate the identified forest ownership into one or more RMBs by DNR Region, and preferably, by watershed administrative unit (WAU).
 - If the forest landowner in a DNR Region establishes one RMB, it will be covered in a single RMAP.
 - LFLO road systems can be allocated into multiple RMBs to be covered by one or more RMAPs. Multiple RMBs must have a prioritized maintenance schedule based on the criteria listed in WAC 222-24-051 (3).

*Note: LFLOs should utilize the attached **Inventory Scheduling Table A** as the first tool of prioritizing RMBs. The RMB rank number in the table can be determined by (a) assigning the proposed value to each priority criterion assessed as a major public resource issue within the RMB, (b) calculating the sum of these assigned values for each RMB, (c) sorting the RMBs in the table from the highest to the lowest summed value, and (d) assigning a priority rank number to each RMB.*

- Large forest landowners submitting more than one RMAP should further group the RMBs so that initial RMAPs cover groups with the highest priorities first.
- Inventory scheduling proposals submitted by LFLOs in DNR regions should include the following items:
 - The completed *Inventory Scheduling Table A*
 - An 8"x11" or an 11"x17" RMB locator map that shows:
 - ❑ Sections, Township, and Range
 - ❑ WAU(s) if applicable
 - ❑ Forest land ownership in the DNR region
 - ❑ RMB(s)
 - ❑ Legend, landowner name, and date of map preparation

Submitting Road Maintenance and Abandonment Plans - WAC 222-24-051 (5)

- RMAPs should include the following components:

- Topographic maps at a 1:12,000 or 1:24,000 scale showing:
 - ❑ Sections, Township, and Range
 - ❑ WAU(s) if applicable
 - ❑ Forest land ownership
 - ❑ RMB(s) if applicable
 - ❑ All forest roads including orphan roads
 - ❑ Planned and potential abandonment
 - ❑ All Typed water (field verify water type using Forests & Fish emergency rules)
 - ❑ Type A and B Wetlands that are adjacent to or crossed by roads
 - ❑ Stream adjacent roads and an inventory of the existing condition
 - ❑ Legend, landowner name, and date of map preparation

- A description of standard practices to be used for routine maintenance using enhanced best management practices (BMPs). Identify whether maintenance will be frequency-determined or condition-determined. *(See Forest Practices Board Manual Section 3 for road related BMPs).*

- A storm maintenance strategy that includes:
 - ❑ Pre-storm planning
 - ❑ Strategies for emergency maintenance
 - ❑ A post-storm recovery plan

- An inventory/assessment of the risk to public resources or public safety of orphan roads.

- A long-term road management plan that does not contain project specific details. Long-term plans locate and identify road system elements (e.g. road segments, water crossings, and other features) to be maintained. They also are used to schedule maintenance work in a priority order. Priorities for road maintenance work within plans are listed in WAC 222-24-051 (6).

*Note: Attachments included to aid LFLOs in planning work are: (1) **Forest Road Assessment Issue Sheet** which contains ID codes that can be used on maps and with Table C to describe existing conditions/issues and proposed work/solutions. (2) **Table C – RMAP Assessment and Scheduling Worksheet** for long-term RMB maintenance scheduling. And (3) the **Road Maintenance and Abandonment Plan** cover sheet used for summarization.*

LFLO Annual Plan Submittal

- LFLOs will submit an annual plan with the initial RMAP, and with each annual report thereafter until the end of 2015. The annual plan provides project specific details within each RMB for the next 12-month period.
 - In the annual plan, identify contributing sources of potential or actual resource damage and provide individual, time-specific plans to deal with them. Identify any improvements and/or modifications to road systems or components, such as stream crossing culverts, bridges, ditches, surfacing, or re-construction planned for the time period. Any details that cannot be fully represented on a Forest Practices Base Map should be included, such as sidecast pullback, slide stabilization areas, and road abandonment details.
 - Work detailed in the annual plan must be office and field verifiable. An acceptable format for office verification is to reference site specifics on the RMAP map using ID codes from the **Forest Road Assessment Issue Sheet**. Complex road maintenance proposals may require descriptions of work in a tabular format, cross referenced to map points. For field verification, individual field reference points using road stationing or GPS coordinates are acceptable. Describe how field markings can be located.

*Note: The attached **Table C – RMAP Assessment and Scheduling Worksheet** and **Annual Plan** sheet may be used to track and summarize annual projects over multiple RMBs.*

Forest Practices Application (FPA) Submittal - WAC 222-20-010 (1)

- Prepare and submit a FPA together with each RMAP for planned activities that require an approved FPA. The FPA must include project specific details of all applicable road management activities. (*See LFLO Annual Plan Submittal above for an example of detail required*). If the FPA specifically refers to a LFLO annual plan as containing the project specific details, those details need not be submitted a second time.

- Include detailed Base Maps (*available at DNR region headquarters*) that show specifics of the planned projects covered in the FPA.

Note: Maps submitted with the RMAP can be used if they also include DNR map registration TICS. TICS are available to GIS users from the DNR Maps Help Desk in Olympia. Phone 360-902-1420.

- Include any applicable FPA addendums.

Conducting Work and Submitting Annual Reports - WAC 222-24-051 (8)

- Implement the plan and complete all work as approved.

- On the anniversary date of filing the initial RMAP and each year thereafter until the end of year 2015, submit a RMAP annual report.

*Note: LFLOs may utilize the attached **Table C – RMAP Assessment and Scheduling Worksheet** to report work performed during the report-year. The **Accomplishments Report** serves to summarize road maintenance and abandonment accomplishments completed during the previous twelve months. This form can also be used to report modifications to the original RMAP. Updated RMAP maps may be required for clarification of accomplishments and/or modifications.*

ROAD MAINTENANCE AND ABANDONMENT PLAN of

For Department Use Only				
DNR Region ID	Submittal Date	Approval Date		Type and ID of Other Plans
	Forest Ownership in this DNR Region			HCP:
RMAP ID	Less than 500 Acres	[]	500 or more Acres	[] WSA:
	Plan-Year to Complete All Accomplishments			:

Landowner Name: _____ *Org. Unit (if applicable):* _____
Mailing Address: _____
Contact Person Name: _____ Employee of: _____
Mailing Address: _____
E-Mail: _____ Phone #: _____ Cellular #: _____ Fax #: _____
Acres of Forest Ownership in WA State: _____ in this DNR Region: _____ (100 Percent)
Acres Covered in this DNR Region by Previous Plan(s): _____ by Current RMAP: _____
Percent of Forest Ownership Covered by Previous and Current Plans in this DNR Region: _____

Conditions Covered In This RMAP

Number of Existing Artificial Fish Passage Barriers at Water Crossings: _____
Approximate Stream Miles of Fish Use Currently Blocked by These Artificial Barriers: _____
Miles At Standard Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____
Miles Below Standard Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____

Proposed Work Covered In This RMAP

Abandon Crossings On Water With Fish Bearing Capacity: _____ Other Water Crossings: _____
Abandon Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____
Improve Crossings On Water With Fish Bearing Capacity: _____ Other Water Crossings: _____
Improve Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____
Maintain Crossings On Water With Fish Bearing Capacity: _____ Other Water Crossings: _____
Maintain Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____

Accomplishments Completed SINCE March 20, 2000 In The Area Covered In This RMAP

Number of Removed Artificial Fish Passage Barriers at Water Crossings: _____
Approximate Stream Miles Opened for Fish Use by Removing These Artificial Barriers: _____
Abandoned Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____
Improved Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____

Optional: Accomplishments Completed BEFORE March 20, 2000 In The Area Covered In This RMAP

Number of Removed Artificial Fish Passage Barriers at Water Crossings: _____
Approximate Stream Miles Opened for Fish Use by Removing These Artificial Barriers: _____
Abandoned Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____
Improved Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____

Date: _____ / _____ / _____ Landowner/Designee Signature: _____

Printed Name: _____

Accomplishments Report
Report-Year 20 _____

For Department Use Only					
DNR Region ID	Submittal Date		Acceptance Date		Type and ID of Other Plan(s)
	Forest Ownership in this DNR Region				HCP:
Annual Report ID	Less than 500 Acres	[]	500 or more Acres	[]	WSA:
	Include copies of Table "C" that shows completed work				:

Landowner Name: _____ *Org. Unit (if applicable):* _____
 Mailing Address: _____

Contact Person Name: _____ Employee of: _____
 Mailing Address: _____
 E-Mail: _____ Phone #: _____ Cellular #: _____ Fax #: _____

Completed Accomplishments In Report-Year In This DNR Region

Number of Removed Artificial Fish Passage Barriers at Water Crossings: _____
 Approximate Stream Miles Opened for Fish Use by Removing These Artificial Barriers: _____
Abandoned Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____
Improved Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____

Planned Work Not Completed In Report-Year In This DNR Region

Abandon Crossings On Water With Fish Bearing Capacity: _____ Other Water Crossings: _____
Abandon Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____
Improve Crossings On Water With Fish Bearing Capacity: _____ Other Water Crossings: _____
Improve Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____
Maintain Crossings On Water With Fish Bearing Capacity: _____ Other Water Crossings: _____
Maintain Miles of Stream Adjacent Parallel Rd: _____ Other Forest Rd: _____ Orphan Rd: _____

Comments

Date: ____ / ____ / ____ Landowner/Designee Signature: _____

Printed Name: _____

ROUTINE MAINTENANCE PRACTICES FOR FOREST ROADS

For: _____

Overview

Forest roads on this ownership will be brought up to and maintained to the specific standards found in the Washington forest practices rules & regulations. These roads will be maintained in conjunction with operations and will be routinely maintained during periods of low use in order to keep them in compliance with current standards. Each road will be inspected every year, at a minimum. When problems are encountered or when a road or segment no longer meets the standards set forth in the Washington forest practices rules, a new schedule and detailed work plan will be developed during the inspection.

All roads will be inspected prior to active haul and needed maintenance work will be completed prior to hauling unless otherwise specified in this plan. Active haul roads are subject to the Storm Plan found in the road maintenance plan. Active haul roads will be maintained to the BMPs listed below.

Forest Roads – General Maintenance Practices

A. Cut and Fill Slopes

- ▶ Slides from the ditches and roadway will be removed. Overhanging material from the cut and fill slopes will be removed to restore the natural angle of repose.
- ▶ Landslide areas with potential to deliver debris to any Typed water will be stabilized by fill pullback, weight placed at toe of slope, compaction, gabion placement, abandonment, and/or other measures as appropriate.
- ▶ Waste material from slides or other sources will not be deposited in streams or at locations where it can erode into Typed waters.
- ▶ Undesirable slide materials and debris will not be mixed into the surface material.
- ▶ Exposed cut and fill slopes will be seeded with erosion resistant vegetation.
- ▶ Buffers such as slash windrows, silt fences, or rip-rap will be placed along stream adjacent roads where there is potential for surface erosion sediment delivery to Typed waters.

B. Road Surface

- ▶ The road surface, turnouts, and shoulders will be graded and shaped to the original crown, inslope, or outslope as needed to provide a suitable travel surface and control water runoff in an even, dispersed manner. Grading may be substituted with a lift of surface rock.
- ▶ Grading will not undercut the back slope of the bottom of the ditchline.
- ▶ Desirable surface material will not be bladed off the roadway.
- ▶ Surface material lost or worn away will be replaced.
- ▶ Outside berms will be removed except those needed to protect sensitive slopes and fills.

C. Drainage: Ditched Roads

- ▶ Ditches and drainage channels at inlets and outlets of culverts will be kept clear of obstructions and functioning as intended.
- ▶ Culverts will be inspected and cleaned routinely and immediately after any significant storm events regardless of harvest activity.
- ▶ Where a relief culvert outfall drains onto unprotected erodible material, a rock apron, flume, down spout, and/or rock energy dissipater will be installed to prevent erosion below the outfall.
- ▶ Silt bearing surface runoff will be prevented from entering Typed waters. This will be achieved by adding relief culverts, clean hard rock, ditch filters, or silt ponds. Drainage structures will be inspected and cleaned routinely as needed.
- ▶ Existing relief culverts in good shape and functionally adequate but not meeting current minimum diameter requirements may remain until worn out. When the relief culvert is replaced, it will be upgraded to at least the 18-inch western Washington or 15-inch eastern Washington diameter standard.

D. Drainage: Out-sloped Roads

- ▶ A 3% outslope will be maintained where appropriate.
- ▶ Drivable dips will be installed in the road subgrade as necessary to control surface runoff.

- ▶ Waterbars may be installed as necessary when the road is not in use.

E. Relief Culvert Installation

- ▶ All new installations on road grades in excess of 3% will be skewed at least 30 degrees from perpendicular to the road centerline.
- ▶ Relief culverts will be installed using a slope steeper than the incoming ditch, but not less than 3% nor more than 10%.
- ▶ Rock armored headwalls at culvert inlets will be constructed and maintained to the road shoulder level with material that will resist erosion.

F. Seeps and Springs

- ▶ All seasonal and year round springs entering the road ditchline will be cross drained through the roadbed within 50 feet of where it enters the ditchline.

G. Non-Fish Habitat Stream Crossings

- ▶ New or replacement stream crossing installations will be sized, and the fill protected, to accommodate a 100-year flood. Rock armor headwall culvert inlets will be installed where the stream gradient above the crossing is greater than 6 %.
- ▶ Existing stream crossings will be inspected for scour, sediment delivery, outfall, and flow adequacy. If the structure is functioning with little risk to public resources it will be maintained until the end of its functional life. For culverts not being replaced, maintenance will include culvert inlet and outlet cleanout, culvert repairs, fill erosion control, and other work as needed.

Note: For work proposed over the bankfull width of non-fish habitat streams, a Hydraulic Project Approval may be needed from the Washington Department of Fish and Wildlife.

H. Streams, Fish Habitat

- ▶ In addition to requirements for non-fish habitat stream crossings, fish passage for adult and juvenile fish will be maintained. New stream crossings will be designed and installed to ensure fish passage.
- ▶ For work proposed over the bankfull width of fish bearing streams or Type A or B Wetlands, a Hydraulic Project Approval will be obtained from the Washington Department of Fish and Wildlife.

I. Bridges

- ▶ Exposed bridge fills next to streams will be armored or rip rapped to prevent erosion.
- ▶ Bridge approaches will be maintained to be level with the bridge deck with crushed rock or pavement.
- ▶ Bridges will be anchored within 10 vertical feet of the 100 year flood level.
- ▶ Bridges will have curbs or splashguards installed.
- ▶ All bridge decks will be sealed to prevent road water and mud from dropping through to streams.

J. Fords

- ▶ Fords that are not functional will be abandoned, rock armored, paved, or replaced with a culvert or bridge as necessary.

Storm Maintenance Plan

A. Pre-storm Planning

1. Relief culverts will be inspected and cleaned as necessary prior to October 1 of any given year.
2. Waterbars that are installed will be re-established prior to October 1 of any given year.
3. Silt fences and settling ponds will be inspected and cleaned prior to October 1 of any given year.
4. Waste areas will be identified on areas that are known to be stable and that have no potential to damage a public resource.
5. When storm related maintenance issues are discovered, the landowner will be responsible for follow-up.

B. Storm Event Emergency Maintenance Strategy

1. All roads within the system will be patrolled within 72 hours of a major storm event.
2. Damage will be assessed then repaired or stabilized by a priority determined by the damage or potential to damage a public resource.
3. Appropriate maintenance or repair actions will be taken based on these observations and the affected agencies will be contacted (e.g., DNR, DOE, WDFW, County).

C. Post Storm Recovery

1. Repair follow-up will be prioritized with fish bearing streams a number one priority.
2. Drainage structures that fail will be replaced with adequate sized structures designed to handle a 100-year flood event.
3. Waste areas will be compacted then reseeded before the next winter season.
4. Cutbank failures that have potential to deliver sediment to a Typed water will be vegetated as soon as possible.
5. Emergency repair work done will be addressed in a RMAP annual report.

This document represents the general maintenance strategies that will be followed relating to forest practice roads under my ownership. I understand that this proposal is subject to current rules and regulations of the forest practices act, as well as any applicable Federal, State, or Local rules and regulations.

Landowner/Designee Signature

Date

Print Name

Forest Road Assessment Issue Sheet

The following road related issues are priority concerns that require review during the road assessment process. If a segment of road has one of the problems below, show the issue number, *such as A2 for "Multiple culverts at the same crossing"*, in the "Assessment Issue" column on Table C.

[A] FISH PASSAGE CULVERTS (*See Section 3 of the FP-Board Manual for more fish passage barrier information*)

- 1) Culverts or other structures that have a drop or fall from the outlet.
- 2) Multiple culverts at the same crossing.
- 3) Small diameter culverts that restrict flow and increase water velocity.
- 4) Culverts installed on a steep gradient.
- 5) Culverts without stream substrate (e.g. gravel) in them.

[B] MASS WASTING (LANDSLIDES) FROM UNSTABLE AREAS (*That may deliver sediment or threaten public safety*)

- 1) A road segment containing slides and earth movement or has a history of slides.
- 2) The road is cracked or settled, especially on the outside shoulder.
- 3) Landings are perched on steep side slopes above streams.
- 4) Stream crossing approaches where the ground suddenly increases in steepness.
- 5) Multiple springs and seeps in the cutslope.
- 6) Cracks in fill slopes.
- 7) Relief drainage water directed onto steep slopes.

[C] SEDIMENT DELIVERY TO TYPED WATERS

- 1) Road ditches that drain directly into streams or wetlands.
- 2) Streams routed down road ditches before entering culverts.
- 3) Dirty road drainage water spilling over fills into streams or wetlands.
- 4) Seeps and springs that mix with dirty road ditch water.
- 5) Ditchlines are deeply eroded due to steep road gradient and few cross drains.
- 6) Water runs down wheel ruts not allowing water to get off of road surface.
- 7) Concave stream crossings where road is downhill to the crossing.

[D] STREAM ADJACENT PARALLEL ROADS

- 1) Roads located within Riparian Management Zones (RMZ).
- 2) Roads where the toe of the fill is the stream bank.
- 3) Roads where floodwaters may reach the fillslope of the road.
- 4) Relief drainage water outlets directed into any streams or wetlands.
- 5) Areas where road surface waters spill off the roadbed into stream channels.

[E] CULVERTS OR OTHER WATER CROSSING STRUCTURES ON NON-FISH HABITAT STREAMS

- 1) Small diameter culverts that restrict flow, causing washouts and scour during flood events.
- 2) Small diameter culverts that back up gravel bars on the upstream side of the culvert.
- 3) Steep fill slopes.
- 4) Unstable fills.
- 5) Structure is a box culvert or puncheon.
- 6) Drop on the outfall of the culvert causing fill erosion.
- 7) Damaged or blocked structures reducing flow capacity.

[F] HYDROLOGIC CONNECTIVITY (*Water is routed out of its natural channel or flow pattern*)

- 1) Spring and seep waters located along road cut banks are routed down the ditch into a typed water or wetland.
- 2) Spring and seep waters that flow into the ditch are routed into a different drainage.

[G] ORPHAN ROADS (*Roads not used since 1974 must be identified and assessed*)

- 1) An orphan road with no resource issues.
- 2) An orphan road with water running down the old grade to a stream or steep area.
- 3) An orphan road with stream crossings especially where deep fills exist.
- 4) An orphan road with box culverts, puncheons, old bridges, fords or washouts.

[H] OTHER ISSUES (*Describe on an attachment*)

Table "C" - RMAP Assessment and Scheduling Worksheet

Landowner Name: _____

For Department Use Only DNR Issued RMAP ID: _____ Watershed Administrative Unit (WAU): _____

Road Name/ID	Problem Area Number	Length*		Road Element Being Evaluated **	ASSESSMENT ISSUE	WORK DESCRIPTION OR Assessment Comments	Month and Year When Work is Planned to		Year Work Completed
		From	To				Begin	End	

*Starting with zero at the beginning of each road or where that road enters your forest land, measure your roads in miles or feet.

****Road Elements would include:**

Road Segments: 1 = Forest Road; 2 = Stream Adjacent Parallel Road; 3 = Orphan Road; or **Point Features:** 4 = Crossing of a Type 1, 2, or 3 Water; 5 = Type 4 or 5 Water or Wetland Crossing; 6 = Landing; 7 = Rock or Borrow Pit; 8 = Disposal site; 9 = Road Intersection.

Assessment Issues would come from the attached Forest Road Assessment Issue Sheet or if the feature being addressed meets current standard leave column blank.

A road segment relates to one or more issues that can occur on a long segment of a road such as "Sediment Delivery". Common problems on a road segment can be grouped on the assessment form while each point feature needs to be described individually. Point features, such as "Type 4 or 5 Water Crossing" as described above refers to an occurrence of a problem at a given point on a road.

**SMALL FOREST LANDOWNER CHECKLIST ROAD
MAINTENANCE AND ABANDONMENT PLAN (RMAP)**

FPA/N # _____
RMAP # _____

Small Forest Landowner Checklist Road Maintenance and Abandonment Plan (RMAP)

Instructions: The Department of Natural Resources' Checklist RMAP Brochure on road maintenance standards needs to be read before completing this checklist. Assistance is available from the local DNR region office.

Map(s) need to be attached to the Checklist (this can be a copy of the map with the Forest Practices Application/Notification) that show the following:

1. Section, Township, and Range (legal description);
2. Landowner's Forest Roads that are included in the Checklist;
3. Landowner's Orphan Roads;
4. Waters and Wetlands within 200 feet of Forest Roads.
5. Legend (Do not use color-coded legends)

Maps are available from the DNR Forest Practices website via the Internet at <http://www.dnr.wa.gov/forestpractices> or from any DNR region office. The map needed is called an "Activity Map". Applicants need to know the section, township, and range (legal description) in order to download or request an Activity Map. The county assessor's office can help determine the landowner's legal description.

Checklist:

1. Checklists can be completed for all the forest roads on your property, or just those forest roads on your property used with the Forest Practices Application. Which roads are addressed in this checklist?
 Just the forest roads on my property used with the Forest Practices Application/Notification
 All my forest roads on my property
2. Is there typed water or wetlands within 200 feet of the existing *forest haul* roads on the forest property?
 Yes Check the activity map and WAC 222-16-031 and WAC 222-16-035 for definition of typed water and wetlands
 No If no, skip to question 6
3. Do culverts and/or bridges obstruct stream flow during?

Low Stream Flow	High Stream Flow
<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<input type="checkbox"/> No	<input type="checkbox"/> No
<input type="checkbox"/> Uncertain	<input type="checkbox"/> Uncertain

NOTE: If yes or uncertain are marked, please show the locations of the culverts/bridges on the attached map

4. Are all culverts routinely checked and maintained to prevent blockage by debris?
 Yes
 No
5. Are there any culverts and bridges installed prior to May 14, 2003 that cross fish habitat streams?
 Yes. Please show the locations on the attached map and please complete the Application for Fish Passage Barrier Assessment
 No
 Uncertain. Please show the locations on the attached map and please complete the Application for Fish Passage Barrier Assessment
6. Does water from seeps or springs pass directly across the road through culverts, waterbars, or dips onto the forest floor?
 Yes
 No
7. Are cross-drains (relief culverts) undamaged, open, and do they divert ditch water?
 Yes
 No
 Uncertain
8. Do road ditches show signs of erosion or down cutting?
 Yes
 No
9. Does water drained from the road create gullies below the road?
 Yes
 No
10. Does water from the road surface run directly into a stream or dry stream channel?
 Yes
 No
 Uncertain
11. Is ditch water diverted onto forest floor or filtered before entering flowing water?
 Yes
 No
12. Are road fills and cut slopes stable and vegetated, without signs of slope slippage?
 Yes
 No
 Uncertain

13. Are there plans to abandon any forest roads on this property?

- Yes. Show these on the attached map(s)
- No

14. Orphaned roads are roads or railroad grades that have not been used for forest practices activities since 1974. Are there any orphaned roads on this property that may be a risk to public resources or public safety?

- Yes. Show these on the attached map(s)
- No

Additional Information: _____

I have read DNR's "Checklist RMAP Brochure" on road maintenance standards and have assessed the condition of the forest roads contained in this checklist, to the best of my abilities. I understand that all forest roads on my forest land will need to be maintained to the extent necessary to prevent potential and actual damage to public resources and that I as the forest landowner am responsible for that ongoing maintenance.

Landowner(s) name: _____

Landowner(s) signature: _____ Date _____

Mailing Address: _____

City, State, Zip: _____

E-Mail Address (optional): _____

Telephone Number: _____

Legal Description Section(s): _____ Township: _____ Range: _____ East or West

County Assessor Parcel Number(s): _____

GIS DATA AND METHODOLOGY

GIS DATA AND METHODOLOGY

ALTERNATIVE SMALL FOREST LANDOWNER DATA DEVELOPMENT

The Rural Technology Initiative (RTI), part of the University of Washington's College of Forest Resources, is using a geographic information system (GIS) to identify and compile parcel-based non-industrial private forest (NIPF) data by county for use by the Department of Natural Resources' (DNR's) Small Forest Landowner Office. To date, the RTI has completed data compilation for four westside counties (Clark, Cowlitz, Lewis, and Thurston) and one eastside county (Okanogan). The RTI has used a variety of data sources, including county assessor tax rolls, GIS-based parcels, LandSat satellite imagery, and aerial photography, to identify NIPF lands. However, the methodology and spatial data layers used by the RTI for each county completed so far have differed based on the information available at the time of processing and direction from DNR's Small Forest Landowner Office. For the analyses in this environmental impact statement (EIS), the Clark County data set was not used because a data processing error was found that affected the forested acres information provided in the data set.

Identifying small forest landowners based on an annual harvest limit (as defined in RCW 76.13.120(2)(c)) was not possible because available information did not provide sufficient detail. Instead, the RTI used a previous acreage-based definition from RCW 76.13.010(4), which identifies non-industrial forests and woodlands as "those suburban acreages and rural lands supporting or capable of supporting trees and other flora and fauna associated with a forest ecosystem, comprised of total individual land ownerships of less than 5000 acres and not directly associated with a wood processing or handling facilities."

The RTI used assessor tax rolls and GIS-based parcel data to identify those parcels that are taxed based on a forest land use (small forest landowners). LandSat satellite imagery and/or orthophotography were used to identify forested lands for other parcels. The forest lands identified from the imagery were overlaid with assessor parcel data to determine which forested lands coincided with non-conflicting land uses as recorded in the assessor tax rolls (possible small forest landowners).

The resultant small forest landowner geodatabase created by the RTI classifies each parcel into one of seven owner types:

0. Unknown
1. Small forest landowner (based on county assessor tax roll land use classification)
2. Possible small forest landowner – at least 75% forested with land use code 89, 91, or 99 (non-conflicting land uses)
3. Industrial (industrial forest land)
4. Public (city, county, state, or federal land)
5. Possible small forest landowner – minimum of five forest acres
6. Possible FPP – minimum of one forest acre (potentially eligible for fish passage program funding)

Appendix D

The RTI's small forest landowner geodatabase was acquired for use in this EIS. Although the geodatabase only covers five counties within the state (four of which were used for this analysis; see above), this data set provides detailed information that can be used to evaluate alternatives. Lands classified as owner type 1, 2, or 5 (small forest landowner or possible small forest landowner) were used to identify small forest landowners for the evaluation of alternatives (Table D-1). The RTI database cannot be used to identify public landowners that might be affected by road maintenance and abandonment planning requirements, because these requirements do not apply to federal lands and the RTI's data do not distinguish among public landowner types (e.g., federal, state, county, municipal). Therefore, to avoid including federal lands with small forest landowner properties, only the RTI private forest landowner data were used for this EIS.

In its small forest landowner geodatabase, the RTI provided unique owner identification numbers based on the assessor records (name and address) maintained in their geodatabase. To identify the landowners that would meet the different definitions of small forest landowner in this EIS, these identification numbers were used to calculate total forest acres by individual owner. The geodatabase also included the acres of forested land in each parcel (TIMBRACRES) as well as the total area of each parcel (both GIS-calculated [GISACRES] and from assessor tax rolls [TAXACRES]).

For Alternative 1 (No Action), small forest landowner properties were defined as those single-owner lands that total less than 500 acres of forest land (using TIMBRACRES, rather than total parcel acres in GISACRES). It should be noted that qualitative analyses in the EIS found that the differences between the road maintenance and abandonment plan (RMAP) planning requirements for small and large forest landowners under Alternative 1 would not result in any differences in anticipated resource impacts. Under Alternative 1, all landowners, regardless of size class, would be required to complete RMAPs within five years of the effective date of the rule or by December 31, 2005. Therefore, numerical values presented for Alternative 1 in the EIS text and tables include owner types 1, 2, and 5, as well as those classified as owner type 3.

For Alternatives 2 and 3, small forest landowner parcels were defined based on a 5000-acre maximum. Five thousand acres is considered a reasonable estimate of the amount of forest land necessary to support a timber harvest rate of 2 million board feet per year, which is the basis for the definition of small forest landowners under both alternatives. Two subgroups of small forest landowner owners were also identified to address specific RMAP rule exemptions. Individual owners in both subgroups own 80 acres or less; owners in the first subgroup have no contiguous blocks of forest land larger than 20 acres, and owners in the second subgroup have at least one contiguous block of forest land larger than 20 acres. Landowners in the first subgroup were assumed to meet the criteria for small forest landowners exempted from RMAP planning under Alternatives 2 and 3, as defined in WAC 222-24-0512 ("Forest landowners owning 80 acres or less of forest land in Washington who are submitting a forest practices application or notification for a block of forest land that is 20 contiguous acres or less in area are not required to submit either a checklist road maintenance and abandonment plan or a road maintenance and abandonment plan."). For analyses in this EIS, it was assumed that landowners in the second subgroup would be required to complete a Checklist RMAP.

Table D-1. Summary of the RTI Small Forest Landowner Database for Cowlitz, Lewis, Thurston, and Okanogan Counties.

Owner Type ^{1/}	Cowlitz County		Lewis County		Thurston County		Okanogan County	
	Forested Acres	Parcel Acres	Forested Acres	Parcel Acres	Forested Acres	Parcel Acres	Forested Acres	Parcel Acres
Small Forest Landowner Types (NIPF or possible)								
1	48,965	52,513	134,585	147,627	48,630	54,180	44,174	67,830
2	19,461	19,890	28,740	29,392	0	0	0	0
5	0	0	0	0	81,599	102,918	121,935	225,604
<i>Subtotal</i>	<i>68,426</i>	<i>72,403</i>	<i>163,325</i>	<i>177,018</i>	<i>130,229</i>	<i>157,098</i>	<i>166,109</i>	<i>293,434</i>
Other Owner Types (Not Small Forest Landowners)								
0	56,517	91,351	97,612	177,349	8,521	63,644	23,171	477,064
3	378,044	422,909	502,279	568,936	77,217	87,890	22,859	132,923
4	107,485	137,181	570,869	635,120	80,609	109,095	973,579	1,583,741
6	0	0	0	0	29,022	43,172	8,640	47,990
<i>Subtotal</i>	<i>542,045</i>	<i>651,441</i>	<i>1,170,760</i>	<i>1,381,405</i>	<i>195,369</i>	<i>303,801</i>	<i>1,028,248</i>	<i>2,241,718</i>
Total	610,471	723,844	1,334,085	1,558,423	325,598	460,898	1,194,357	2,535,152

1/ Owner Type codes:

- 0. Unknown
- 1. Small forest landowner (based on county assessor tax roll land use classification)
- 2. Possible small forest landowner – at least 75% forested with land use code 89, 91, or 99 (non-conflicting land uses)
- 3. Industrial (industrial forest land)
- 4. Public (city, county, state, or federal land)
- 5. Possible small forest landowner – minimum of five forest acres
- 6. Possible FPP – minimum of one forest acre (potentially eligible for fish passage program funding)

Appendix D

Based on the above, small forest landowners and possible small forest landowners identified by the RTI data were divided into four subclasses. These subclasses were defined by the acreage of each landowner's total holdings and, for those with 80 acres or less, the size of individual and/or groups of contiguous parcels. The subclasses were assigned codes (SFLO_ALT), as follows:

- 80: owners with not more than 80 acres of forest land and no contiguous blocks of forest land larger than 20 acres,
- 8020: owners with not more than 80 acres of forest land and at least one contiguous block of forest land larger than 20 acres,
- 500: owners with more than 80 acres and less than 500 acres of forest land, and
- 5000: owners with more than 500 acres and less than 5,000 acres of forest land.

Table D-2 presents the acreage of forest land and the total acres owned by small forest landowners in the four different SFLO_ALT classes.

Table D-2. Forested and Total Parcel Acres by SFLO_ALT

County	SFLO_ALT	Forested Acres	Parcel Acres
Cowlitz	80	17,356	18,649
	8020	21,851	22,845
	500	24,866	26,307
	5000	4,352	4,603
	Total	68,426	72,403
Lewis	0	10,514	11,020
	80	25,081	27,931
	8020	44,625	48,598
	500	59,342	63,623
	5000	23,763	25,846
Total	163,325	177,018	
Okanogan	80	25,168	57,840
	8020	51,243	77,736
	500	63,183	117,830
	5000	26,515	40,028
	Total	166,109	293,434
Thurston	80	34,112	42,635
	8020	34,255	41,186
	500	38,579	46,794
	5000	23,283	26,482
	Total	130,229	157,098

Notes: SFLO_ALT acreage values do not sum to total values in all cases due to rounding errors. SFLO_ALT code of "0" indicates owners classified in the RTI database as small forest landowners, but who own more than 5,000 forest acres. These landowners are not considered small forest landowners for this analysis.

The alternatives analyzed in this EIS incorporate up to three categories of RMAP planning requirements for small forest landowners: RMAP, Checklist RMAP, or Exempt (no RMAP required). Table D-3 summarizes the method by which the RTI data were used to identify private forest landowners who fall into each category.

Table D-3. Use of the RTI Data to Determine Road Maintenance and Abandonment Planning Requirements for small forest landowners under Alternatives 1, 2, and 3

Owner Type	SFLO_ALT	Alternative 1	Alternatives 2 and 3
3 (Industrial)	N/A	RMAP	RMAP
1, 2, or 5	5000	RMAP	Checklist RMAP
(small forest landowner or Possible small forest landowner)	500	RMAP	Checklist RMAP
	8020	RMAP	Checklist RMAP
	80	RMAP	Exempt

For all alternatives, multiple small forest landowner parcels with the same owner were grouped together for comparison to the total forested land size maximum for each alternative. Three limitations to this grouping process were identified from the data provided by the RTI:

1. Detailed data were available for only a subset of counties within the state; therefore, some owners identified as small forest landowners based on the available data may not actually be classified as small forest landowners if ownership within the entire state was considered.
2. When RTI assigned unique owner identification numbers, any inconsistencies between names or addresses (i.e., names and addresses not exactly the same between parcels) resulted in different identification numbers. Also, some parcels had no owner identified. Consequently, total acres for some owners may be underestimated and possibly incorrectly classified as small forest landowners under one or more of the alternatives.
3. Contiguous forested lands that are owned by multiple heirs of an original landowner were not grouped together for the identification of small forest landowners. However, these lands may still be managed as if owned by a single entity.

OTHER GIS DATA USED FOR ANALYSES

Several GIS data layers were used in conjunction with the RTI's small forest landowner geodatabase to evaluate relative difference between alternatives. These layers were selected based on their relevance to the resources that are addressed in this EIS. Although these GIS data layers do not provide complete coverage of all existing features, overlaying them with the county small forest landowner data sets provides an indication of the relative differences between numbers and areas of features present based on the different definitions of small forest landowner parcels included in the alternatives.

- Inventoried culverts, dams, and fishways (Washington Department of Fish and Wildlife [WDFW])

Appendix D

- Transportation (DNR)
- Hydrography (DNR)
- Wetlands (DNR)
- Existing landslides (DNR)
- Predicted slope stability (DNR)

WDFW provided a current version of its Fish Passage and Diversion Screening Inventory Database. For each culvert inventoried, this database contains information on the culvert's location, physical characteristics, and fish passage barrier status. The database contains information for culverts inventoried by WDFW, other state agencies, and local governments and organizations. WDFW uses the information in the database to identify, locate, and prioritize corrections to fish passage barriers. However, the database is continually being updated as more data sets are submitted to WDFW after additional inventories are completed. This database contains records for culverts that are inventoried using WDFW's protocols. Other culverts inventoried using different protocols are not included in WDFW's database.

While the WDFW fish passage database contains information for culverts inventoried state-wide, it does not contain information for all culverts within the state. Subsequently queries as to the approximate amount of each county covered by the inventoried culverts in the database were not successful. Those contacted indicated that they could not estimate the amount of area covered by inventories complete so far. Some of those contacted also indicated that they were in the process of preparing additional culvert inventory data sets for submission to WDFW. Without an approximation of the proportion of counties covered by the culverts in WDFW's data, extrapolating the number of county- and state-wide fish passage barriers was not possible.

The transportation, hydrography, landslides, and predicted slope stability data layers were downloaded from DNR's website. The transportation layer (divided into individual county files) contains road, railroad, and other land and water routes within the state. Attributes stored for the road features stored in the transportation layer include road surface type, classification type, and activity status. DNR originally completed this data layer in 1994 for forested state and private lands. It was extended to cover the rest of the state in 1996. Subsequent site-specific updates have occurred, but primarily on DNR managed lands. The metadata for this data layer indicates that this dataset should not be considered a complete inventory, with existing routes not represented, routes that no longer exist still represented, and some routes not correctly typed as a road, railroad, trail, etc.

The DNR hydrography layer (divided into individual county files) containing linear features (rivers, streams, canals, etc.) was used for this analysis. For the westside counties, the hydrography layer incorporated the new water typing model developed to support implementation of the new Forest Practices Fish Habitat Water Type Map. For Okanogan County, the hydrography layer included linear water features that were typed by DNR's original system. DNR compiled the hydrography layers for forested state, private, and some federal and tribal lands between 1992 and 1994. Over the next two years, DNR integrated data from all other areas within the state using various sources. Updates are made continuously on a site-specific basis.

The predicted slope stability layer was generated by DNR to cover all forested watersheds in the western half of the state. DNR created it using a calibrated model to serve as a screen

for determining shallow-rapid landslide potential for forest practices applications and managed timberlands. The model was based on 10- and 30-meter digital elevation models, and the resulting data layer is a raster-based file that has a 30-meter resolution.

DNR provided the wetlands data layer used by the DNR, Forest Practices Division (as individual USGS 7.5-minute quadrangle tiles that were merged together for analysis). DNR, Forest Practices Division, using the National Wetlands Inventory (NWI) wetlands as a starting data layer, added attributes to match the class and type attributes used by DNR. The metadata for this layer indicates that this information is not complete and should only be used as a first step in screening for possible wetland issues in an area. The data layer may substantially underestimate the distribution of forested wetlands, because the NWI data have a varying level of accuracy when identifying wetlands in forested areas, and some of the source data are more than 20 years old.

ALTERNATIVE ANALYSES

The areas defined as small forest landowners for the three alternatives were overlaid with the other GIS data layers to provide an indication of the level of potential impacts of the alternative small forest landowner definitions. Although small forest landowner parcels were identified based on forested acres within parcels, the actual location of forested lands within parcels was not included in the RTI's geodatabase. Consequently, the GIS-based analyses completed for this EIS quantified resources present within entire parcels owned by small forest landowners, rather than the forested lands within parcels owned by small forest landowners.

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