



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

NATIONAL MARINE FISHERIES SERVICE

1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

MAR 31 2003

MEMORANDUM FOR: James P. Burgess III
NEPA Coordinator

FROM:

R. Hill
for William T. Hogarth, Ph. D.

SUBJECT:

Sequential Environmental Assessment and Finding of No Significant Impact (FONSI) Related to Approving Implementation of a Routine Road Maintenance Program for 26 Jurisdictions in Washington State Under Limit 10 of the Endangered Species Act July 2000 4(d) Rule (50 CFR 223.203(b)(10)) -
DECISION MEMORANDUM

Based on the subject Sequential Environmental Assessment and FONSI, I have determined that no significant environmental impacts will result from the proposed action. I request your concurrence in this determination by signing below. Please return this memorandum for our files.

- 1) I concur *James P. Burgess III* Date: 4/2/03
- 2) I do not concur _____ Date: _____

Attachment.





UNITED STATES DEPARTMENT OF COMMERCE
Office of the Assistant Secretary for
Oceans and Atmosphere
Washington, D.C. 20230

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act (NEPA), a sequential environmental review has been performed on the following action:

TITLE: Sequential Environmental Assessment of a NOAA Fisheries Determination Related to Approving Implementation of a Routine Road Maintenance Program for 26 Jurisdictions in Washington State Under Limit 10 of the Endangered Species Act (ESA) July 2000 4(d) rule (50 CFR 223.203(b)(10))

LOCATION: The State of Washington

SUMMARY: This Sequential Environmental Assessment (EA) analyzes the proposed decision to approve implementation of a Routine Road Maintenance Program for 26 jurisdictions in Washington state under Limit 10 of the July 10, 2000 ESA 4(d) rule (65 FR 42422). In 2002, NOAA Fisheries completed a Programmatic NEPA analysis of the consequences of implementing Limit 10 and determined that no significant impacts resulted from limiting the application of the ESA section 9(a)(1) take prohibitions for routine road maintenance activities that meet the rule's Limit 10 criteria. This EA tiers off the NEPA Limit 10 Programmatic EA and documents the analysis of alternatives for approving routine road maintenance programs in 26 jurisdictions in Washington state. Furthermore, the EA is one piece of an overarching process which includes the Limit 10 4(d) rule effects analysis and the ESA section 7/Essential Fish Habitat consultation.

RESPONSIBLE OFFICIAL: D. Robert Lohn
Regional Administrator
Northwest Region
National Marine Fisheries Service
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

The environmental review process led us to conclude that this determination will not have a significant impact to the human environment. Therefore, an environmental impact statement will not be prepared. A copy of the finding of no significant impact (FONSI), including the Sequential Environmental Assessment, is enclosed for your information. Please submit any written comments to the responsible official named above. Also, please send one copy of your comments to my staff at U.S. Department of Commerce, NOAA/SP- Rm. 6121, 14th & Constitution, N.W., Washington, D.C. 20230.

Sincerely,

James P. Burgess, III
NEPA Coordinator



7.0 Finding of No Significant Impact

INTRODUCTION:

In accordance with the National Environmental Policy Act (NEPA), the National Marine Fisheries Service (NOAA Fisheries) Northwest Region (NWR) has prepared an Environmental Assessment (EA) for its proposed decision to approve implementation of routine road maintenance programs in 26 Washington State jurisdictions under Limit 10 of the July 10, 2000, Endangered Species Act (ESA) 4(d) rule (65 FR 42422) (July 2000 4(d) rule). The rule, which addresses 14 Evolutionarily Significant Units (ESUs) of salmonids listed as threatened under the ESA, and Limit 10, which addresses routine road maintenance (RRM) activities, are fully described in the EA. This EA is a sequential NEPA analysis that "tiers off" of the larger scale Limit 10 Programmatic EA (NOAA Fisheries 2002) which described the broad issues related to potential consequences of implementing Limit 10 under the July 2000 4(d) rule. The Limit 10 Programmatic EA forms the basis for this subsequent, or sequential, NEPA analysis on routine road maintenance programs submitted under Limit 10 by jurisdictions in Washington state. Furthermore, this Limit 10 sequential EA is one piece of an overarching process which includes the 4(d) rule effects analysis and ESA section 7/Essential Fish Habitat consultation on this submittal from Washington state.

SUMMARY:

In accordance with NEPA regulations at 40 CFR Part 1508.13, the findings of the Limit 10 EA are hereby incorporated by reference. NOAA Fisheries considered and analyzed the following four alternatives, all of which are discussed in detail in the EA:

Alternative 1 - No Action: The RRM agencies would conduct their RRM activities as though no RRM program had been prepared and submitted to NOAA Fisheries under the July 2000 4(d) rule Limit 10 for routine road maintenance. Therefore the No Action Alternative consists of the basic set of routine road maintenance activities that the RRM agencies would conduct in the absence of the July 2000 4(d) rule. The 10 ESUs in the analysis area are listed as threatened and the prohibition against taking listed salmonids covered by the July 2000 4(d) rule would be in effect. Federal agencies would be required to consult with NOAA Fisheries pursuant to section 7 of the ESA for all ESA-related activities.

Alternative 2 - Proposed Action (Approve the RRM Program from Jurisdictions in Washington State): NOAA Fisheries would approve the RRM Program submitted by jurisdictions in Washington State under the July 2000 ESA 4(d) rule limit 10(ii). The 10 ESUs in the analysis area are listed as threatened and the prohibition against taking listed salmonids covered by the July 2000 4(d) rule would be in effect, but there would be a limit on their application to activities covered under this RRM Program submittal.

Federal agencies would be required to consult with NOAA Fisheries pursuant to section 7 of the ESA for all ESA-related activities.

Alternative 3 - Approve a Program Comparable to the Oregon Department of Transportation's Routine Road Maintenance Program: NOAA Fisheries would approve an RRM program conducted by a jurisdiction in Washington that is similar to or complies with the *Oregon Department of Transportation (ODOT) Transportation Maintenance Management System Water Quality and Habitat Guide (July 1999)* (Guide). The 10 ESUs in the analysis area are listed as threatened and the prohibition against taking listed salmonids covered by the July 2000 4(d) rule would be in effect, but there would be a limit on their application to activities that meet or exceed ODOT's Guide. Federal agencies would be required to consult with NOAA Fisheries pursuant to section 7 of the ESA for all ESA-related activities.

Alternative 4 - Approve the Routine Road Maintenance Program from Jurisdictions in Washington State but with Targeted Mitigation Measures: NOAA Fisheries would approve an RRM program submitted by jurisdictions in Washington State under Limit 10(ii). The Alternative 4 would be the same in structure and substance to the RRM Program described under the Proposed Action, with the addition of targeted mitigation activities.

NOAA Fisheries selected the Proposed Action over the other alternatives because it will allow the agency to respond, as fully as possible, to the salmon conservation issues identified during NOAA Fisheries' internal NEPA scoping process for this EA and the issues that arose during the public comment period regarding the July 2000 4(d) rule NEPA compliance (65 FR 42422). In combination, the outcome of these two scoping processes revealed the following overall key scoping issues related to the 4(d) rule and the limits:

1. Conserve listed salmonids and the habitat upon which they depend.
2. Follow the mandates of the ESA (observe the law).
3. Allow people to participate more fully in species conservation and thereby encourage voluntary compliance.
4. Streamline the process for making determinations on routine road maintenance programs under the ESA.
5. Develop fertile partnerships with states and local citizens to ensure that future resource activities go forward in a fish-friendly, innovative, and cooperative manner.

The Muckleshoot Tribe commented on the Limit 10 Programmatic EA and raised issues applicable to the Limit 10 Washington submittal. In order to address the Tribe's comments, NOAA Fisheries staff met with the Muckleshoot Tribe's watershed coordinator in January, 2003 to review and discuss the draft Limit 10 EA. The key issues identified by the Muckleshoot Tribe

during this meeting included the following: (1) the need to clarify the descriptions of the Alternatives (subsection 2.0, Alternatives); (2) the question about when NOAA Fisheries will evaluate the population-level impacts of RRM activities (subsection 3.6, Fish); and (3) the need to address the loss of instream habitat structure as a result of ditching and ditch cleaning activities (subsection 3.6.1.4, Aquatic Habitat). The draft EA was revised based on discussions with the Muckleshoot Tribe.

The Proposed Action meets NOAA Fisheries' ESA mandates to conserve the listed ESUs while providing NOAA Fisheries with an additional management tool for conserving listed species. It provides another option to local jurisdictions beyond the ESA section 10 tools to comply with the ESA. It fosters cooperative management relationships with the State of Washington. This alternative also supports the NOAA Strategic Plan because it will help to foster cooperative efforts between NOAA Fisheries and its constituents and customers as described in the EA.

Nine resource categories were described in the Limit 10 EA. It was found that the EA's Proposed Action (i.e., take prohibitions with Limit 10) had no direct or indirect negative impact on the following resources: land use, geology and physiography, climate, demographic trends, economy, tourism and recreation, and cultural resources. Because the EA tiered off of the Proposed Action in the Limit 10 Programmatic EA, the alternatives in the EA would also have no direct or indirect negative impact on these resources and therefore they are not analyzed in this EA. The Proposed Action in the Limit 10 Programmatic EA had either a beneficial or some short term direct or indirect negative impact on the following eight resources and other topics: soils, air quality, water quantity and quality, fish and wildlife, aquatic habitat, vegetation, federal treaty and trust responsibilities, tribal rights and interests¹, and environmental justice. Therefore, NOAA Fisheries considered the effects of the four alternatives on these resources and topics.

In the EA, NOAA Fisheries considered the effects of the alternatives at the watershed and reach scales. The following is a summary of the effects of each alternative. These effects are fully described in the EA.

1. The No Action Alternative was determined to have no significant negative or beneficial direct or indirect effects on the environment at the watershed scale and, therefore, its cumulative impact would be equivalent to a continuation of current environmental trends and conditions. At the reach scale, the No Action Alternative could have minor impacts and short term negative effects associated with soils, air quality, fish (native fish species, salmonid ESUs, threatened and endangered fish species), threatened and endangered wildlife species, aquatic habitat, vegetation, and environmental justice. These reach scale

¹The analysis undertaken for policy alternatives regarding routine road maintenance plans is for ESA purposes only, and NOAA Fisheries makes no implied or explicit assurances that the routine road maintenance plans satisfy treaty Indian fishing rights.

effects may be minor on an individual basis, however, their cumulative effect on the human environment could potentially be negative for a short period of time. In this case, the No Action Alternative does not complement and may conflict with the past, current, foreseeable Federal, Tribal, state, and local plans, policies, and programs aimed at benefitting elements of the Affected Environment such as water quantity and quality, fish passage, shoreline, and fish habitat conditions. Federal, Tribal, state, and local plans, programs, and activities include water quality and pollution control, streamflow enhancement, watershed planning, environmental land use planning and zoning, shoreline protection, and habitat conservation plans.

2. The Proposed Action was determined to have no significant direct or indirect negative impacts on soils, air quality, water quantity, fish (native fish species, salmonid ESUs, threatened and endangered fish species), threatened and endangered wildlife species, tribal treaty rights², or environmental justice issues, and it could have some beneficial impacts (e.g., protection of aquatic habitat and vegetation as compared to the No Action Alternative) which are described in the EA. As compared to the No Action Alternative, the Proposed Action complements, enhances, and is not in conflict with the past, current, and reasonably foreseeable Federal, Tribal, state, and local plans, policies, and programs described in the EA because RRM activities carried out under the Proposed Action would improve trends in properly functioning habitat condition and other factors that support the conservation of listed salmonids.
3. Similar to the Proposed Action, Alternative 3 was determined to have no significant direct or indirect negative impacts on soils, climate, air quality, water quantity, fish (native fish species, salmonid ESUs, threatened and endangered fish species), threatened and endangered wildlife species, tribal treaty rights, or environmental justice issues, and it could have some beneficial impacts (e.g., protection of aquatic habitat and vegetation as compared to the No Action Alternative) which are described in the EA.
4. Alternative 4 was determined to have the same potential environmental impacts as the Proposed Action over the long term. Short term benefits would be realized at the reach scale where targeted mitigation would provide near term biological function to address any short term impacts.

NOAA Fisheries also considered the context and intensity of the factors identified in NOAA NAO 216-6 Section 6.01(b), as well as the short and long term effects of the Proposed Action. Based on the analysis in the EA, NOAA Fisheries finds that:

1. Public health and safety will not be adversely affected, and may benefit from the selected alternative because the Proposed Action may result in improved water quality due of enhanced erosion control practices. Routine road maintenance projects are generally implemented to protect public safety.
2. The Proposed Action's effects on the human environment are not likely to be highly controversial because the July 2000 4(d) rule and the NEPA Limit 10 Programmatic EA have already been subject to public review and comment (65 FR 42422), and their intent is to conserve the listed threatened ESUs. The EA was also reviewed with staff from the Muckleshoot Tribe and revised based on that discussion.
3. This action does not establish a precedent for future actions with significant effects, nor does it represent a decision about a future consideration because it analyzes the effects of a specific routine road maintenance program in Washington State which is consistent with the findings of the Limit 10 Programmatic EA.
4. This action is of limited context and intensity, with limited environmental effects, individually or cumulatively, as fully analyzed in the EA. This decision is not related to other actions with individually insignificant, but cumulatively significant impacts.
5. The effects of this action are relatively certain and do not involve unique or unknown risks because NOAA Fisheries is familiar with the effects related to routine road maintenance activities in Washington.
6. The Proposed Action will not adversely affect areas listed in or eligible for listing in the National Register of Historic Places, or cause loss or destruction of significant scientific, cultural, or historic resources because it does not involve road building or construction activities that would effect these resources.
7. The Proposed Action will not adversely modify or destroy designated essential fish habitat as defined by the Magnuson-Stevens Act because it contains specific aquatic habitat protection measures and mechanical aquatic habitat management that would have no adverse affect on aquatic habitat in the analysis area.
8. The Proposed Action does not threaten a violation of Federal, state, or local legal requirements imposed for the protection of the environment because these requirements were analyzed during the July 2000 4(d) rule rulemaking. The EA found that the Proposed Action complements, enhances, and is not in conflict with the past, current, and reasonably foreseeable Federal, Tribal, state, and local plans,

policies, and programs described in the EA because routine road maintenance activities carried out under the Proposed Action would improve trends in properly functioning habitat condition and other factors that support the conservation of listed salmonids.

Environmental Justice: Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The analysis of the impacts in the EA indicates that there will be no disproportionately high and adverse human health or environmental effects on minority and low-income populations by the Proposed Action.

REFERENCES:

NOAA Fisheries. 2003. Sequential environmental assessment for ESA section 4(d) limit 10 routine road maintenance program submittal from jurisdictions in Washington state. Portland, Oregon.

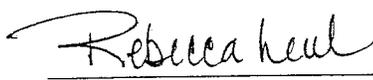
NOAA Fisheries. 2002. ESA section 4(d) limit 10 programmatic draft environmental assessment. Portland, Oregon.

CONTACT PERSON:

Rosemary Furfey, NOAA Fisheries - NWR, Protected Resources Division; phone: 503-231-2149

DETERMINATION:

Based on the analysis in this EA and the EA findings, consideration of discussions with the Muckleshoot Tribe, and in accordance with the guidelines for determining the significance of proposed Federal actions (40 CFR Part 1508.27) and NOAA's criteria for initiating an Environmental Impact Statement (NAO 216-6 Section 6.01(b)), I conclude that the Proposed Action to approve implementation of routine road maintenance programs in 26 Washington State jurisdictions for the continued and necessary routine maintenance of roads in these jurisdictions does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of section 102(2)(c) of the National Environmental Policy Act of 1969 (as amended). Therefore, an environmental impact statement is not required, and a Finding of No Significant Impact (FONSI) for the Proposed Action has been made by the undersigned responsible official.


for William T. Hogarth, Ph. D.
Assistant Administrator for Fisheries
National Oceanic and Atmospheric Administration

Date: 3/29/03



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

March 14, 2003

MEMORANDUM FOR: Laurie Allen
Acting Director, Office of Protected Resources

FROM:

for D. Robert Lohn
Regional Administrator

MAR 14 2003

SUBJECT: TRANSMITTAL OF SEQUENTIAL ENVIRONMENTAL
ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT
Related to Approving Implementation of a Routine Road
Maintenance Program in 26 Jurisdictions in Washington State
Under Limit 10 of the Endangered Species Act July 2000 4(d) Rule
(50 CFR 223.203(b)(10))

**Note: If any of the attachments are forwarded to reviewers and other divisions,
please ensure that this cover transmittal document is attached to the front of those
documents.**

In accordance with National Environmental Policy Act (NEPA), the attached Sequential Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) analyzes the proposed decision to approve implementation of routine road maintenance programs in 26 Washington state jurisdictions under Limit 10 of the July 10, 2000 Endangered Species Act (ESA) 4(d) rule (65 FR 42422) (July 2000 4(d) rule). The rule, which addresses 14 Evolutionarily Significant Units (ESUs) of salmonids listed as threatened under the ESA, and Limit 10, which addresses routine road maintenance activities, are fully described in the EA. In 2002, NOAA Fisheries completed a Programmatic NEPA analysis of the consequences of implementing Limit 10 and determined that no significant impacts resulted from limiting the application of the ESA section 9(a)(1) take prohibitions for routine road maintenance activities that meet the rule's Limit 10 criteria. This EA tiers off the Limit 10 Programmatic EA and documents the analysis of alternatives for approving routine road maintenance programs in 26 jurisdictions in Washington state. The purpose of the EA is to describe the issues related to potential consequences of implementing alternatives and to ensure that no issues are being overlooked. Furthermore, the EA is one piece of an overarching process which includes the Limit 10 4(d) rule effects analysis and the ESA section 7/Essential Fish Habitat consultation.

NOAA Fisheries sought public comment on the Limit 10 Programmatic EA through a notice of availability in the Federal Register (67 FR 37392) published on May 29, 2002 and the comment



period was open until June 28, 2002. Comments were received from the Muckleshoot Tribe in Auburn, Washington, the U.S. Environmental Protection Agency, Region 10, and NOAA Headquarters NEPA staff. NOAA Fisheries did not seek public comment on the Limit 10 sequential EA, however, staff-to-staff consultation was conducted with the Muckleshoot Tribe in January, 2003 to address their previous comments concerning the Washington state routine road maintenance program. The EA was revised based on the staff-to-staff consultation.

NOAA Fisheries - NWR requests completion of review of the Sequential EA/FONSI by March, 2003 or at the earliest possible date. This Sequential EA/FONSI will be included in NOAA Fisheries' upcoming 4(d) rule determination on the Limit 10 routine road maintenance submittal from Washington state, and as such, has been long awaited by the cooperating jurisdictions.

DOCUMENTS PREPARED BY/CONTACT:

Rosemary Furfey, NOAA Fisheries - NWR, Protected Resources Division
phone: 503-231-2149

DOCUMENTS REVIEWED BY:

Spencer Hovekamp, NOAA Fisheries - Habitat Conservation Division
Gabriella Lang, NOAA Fisheries - Protected Resources Division
Kathe Hawe, NOAA Fisheries - NWR, NEPA Co-Coordinator
Kirsten Erickson, NOAA Fisheries - NWR, GCNW
Steve Kokkinakis - NOAA NEPA Staff - NOAA Headquarters
Donna Darm - NOAA Fisheries - Protected Resources Division

COMMENTS/CONTROVERSIES:

No controversy is expected from approval of implementation of routine road maintenance programs in 26 Washington State jurisdictions under Limit 10 of the July 2000 4(d) rule because the rule has already been subject of public review and comment (65 FR 42422), and its intent is to conserve the listed threatened ESUs. In addition, the Limit 10 Programmatic EA, which this EA tiers off of, was subject of public review and comment (67 FR 37392) and it was revised based on public comment. Finally, NOAA Fisheries will also make a 4(d) rule effects determination and conduct a section 7 and Essential Fish Habitat consultation as part of its overall 4(d) rule Limit 10 approval process. There is no known litigation or pending litigation.

ATTACHMENTS:

1. FONSI - Attachment 1
2. Sequential Environmental Assessment
3. Draft memorandum transmitting Programmatic EA/FONSI to OPSP NEPA Office
4. Draft letter to Interested Parties, regarding NEPA determination

cc: (w/o attachments)
Lamont Jackson - PR3
Mike Crouse - NWR4
Rosemary Furfey - NWR3
Kathe Hawe - NWR3

Garth Griffin - NWR3
Kirsten Erickson - GCNW



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

MAR 28 2003

MEMORANDUM FOR: William T. Hogarth, Ph. D.
Assistant Administrator for Fisheries
National Marine Fisheries Service (NOAA Fisheries)

FROM: Laurie Allen, *Laurie K. Allen*
Acting Director
Office of Protected Resources

SUBJECT: Sequential Environmental Assessment and Finding of No Significant Impact (FONSI) Related to Approving Implementation of a Routine Road Maintenance Program for 26 Jurisdictions in Washington State Under Limit 10 of the Endangered Species Act (ESA) July 2000 4(d) Rule (50 CFR 223.203(b)(10)) -
DECISION MEMORANDUM

Attached for your review and signature is a Sequential Environmental Assessment (EA) and FONSI which relates to approving implementation of a routine road maintenance program for 26 jurisdictions in Washington State under Limit 10 of the July 2000 ESA 4(d) rule (65 FR 42422)(July 2000 4(d) rule). The rule, which addresses 14 Evolutionarily Significant Units (ESUs) of salmonids listed as threatened under the ESA, and Limit 10, which addresses routine road maintenance activities, are fully described in the EA. In 2002, NOAA Fisheries completed a NEPA Limit 10 Programmatic EA analysis of the consequences of implementing Limit 10 and determined that no significant impacts resulted from limiting the application of the ESA section 9(a)(1) take prohibitions for routine road maintenance activities that meet the rule's Limit 10 criteria. This EA tiers off the NEPA Limit 10 Programmatic EA. The EA documents the analysis of alternatives for approving routine road maintenance programs in 26 jurisdictions in Washington state as being consistent with the 4(d) rule Limit 10 criteria. The purpose of the EA is to describe the issues related to potential consequences of implementing the four alternatives and to ensure that no issues are being overlooked. Furthermore, the EA is one piece of an overarching process which includes the Limit 10 4(d) rule effects analysis and the ESA section 7 and Essential Fish Habitat consultation.

This EA and FONSI have been reviewed by my staff, NOAA NEPA staff, and staff in the NWR. It has also been reviewed and cleared by General Counsel.

Recommendation

I recommend that you sign the attached FONSI.

Attachment



Final Draft

**NOAA Fisheries
Northwest Region**

ESA Section 4(d) Limit 10

Sequential

Environmental Assessment

February 2003



NOAA Fisheries
Northwest Region
525 NE Oregon Street
Suite 500
Portland, Oregon 97232

1 **SEQUENTIAL ENVIRONMENTAL ASSESSMENT FOR AN ESA SECTION 4(d) RULE**
2 **LIMIT 10 - ROUTINE ROAD MAINTENANCE PROGRAM**
3 **SUBMITTAL FROM JURISDICTIONS IN WASHINGTON STATE**
4 **COVER SHEET**

5
6 February 2003
7
8

9 Title of Environmental Review: Sequential Environmental Assessment
10 Pursuant to National Environmental Policy Act for
11 an ESA 4(d) Rule Limit 10 Routine Road
12 Maintenance Program Submittal from Jurisdictions
13 in the State of Washington
14

15 Responsible Agencies and Officials: National Oceanic and Atmospheric Administration
16 NOAA Fisheries
17 525 NE Oregon Street, Suite 500
18 Portland, Oregon 97232-2737
19 (503) 231-2149
20

21 Contact: Rosemary Furfey
22 Natural Resource Management Specialist
23 Protected Resources Division
24 U. S. Department of Commerce
25 National Oceanic and Atmospheric Administration
26 NOAA Fisheries
27 525 NE Oregon Street, Suite 500
28 Portland, Oregon 97232-2737
29 (503) 231-2149
30

31 Legal Mandate: Endangered Species Act of 1973, as amended,
32 Section 4(d), as implemented 50 CFR Part 223
33

34 Location of Proposed Action: State of Washington

TABLE OF CONTENTS

1			
2			
3	1.0	PURPOSE AND NEED FOR THE PROPOSED ACTION	Page 1
4	1.1	Introduction	Page 1
5	1.1.1	ESA 4(d) Rule and Limit 10	Page 3
6	1.2	Purpose and Need for the Proposed Action	Page 5
7	1.2.1	Purpose of the Proposed Action	Page 5
8	1.2.2	Need for the Proposed Action	Page 6
9	1.3	Environmental Review	Page 6
10	1.3.1	Process	Page 6
11	1.3.2	Limit 10 Programmatic EA Findings	Page 7
12			
13	2.0	ALTERNATIVES	Page 9
14	2.1	Introduction	Page 9
15	2.2	Alternatives Considered but Eliminated from Detailed Study	Page 9
16	2.3	Alternative 1: No Action	Page 9
17	2.4	Alternative 2: Proposed Action -Approve the Routine Road Maintenance Program	
18		from Jurisdictions in Washington State	Page 11
19	2.5	Alternative 3: Approve a Program Comparable to the Oregon Department of	
20		Transportation's Routine Road Maintenance Program	Page 23
21	2.6	Alternative 4 - Approve the Routine Road Maintenance Program from	
22		Jurisdictions in Washington State but with Targeted Mitigation Measures	
23		Page 28
24			
25	3.0	AFFECTED ENVIRONMENT	Page 47
26	3.1	Introduction	Page 47
27	3.2	Soils	Page 52
28	3.3	Air Quality	Page 55
29	3.4	Water Quantity	Page 57
30	3.5	Water Quality	Page 65
31	3.5.1	Water Quality Regulations	Page 66
32	3.5.2	Water Temperature	Page 70
33	3.5.3	Sediment and Turbidity	Page 72
34	3.5.4	Dissolved Oxygen	Page 73
35	3.6	Fish	Page 73
36	3.6.1	Fish	Page 73
37	3.6.1.1	Native Fish Species	Page 75
38	3.6.1.2	Invasive Fish Species	Page 75
39	3.6.1.3	Threatened and Endangered Fish Species	Page 76
40	3.6.1.4	Aquatic Habitat	Page 77
41	3.7	Wildlife	Page 79
42	3.7.1	Birds, Land Mammals, and Herptofauna	Page 79

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42

- 3.7.2 Threatened and Endangered Wildlife Species Page 83
- 3.8 Vegetation Page 84
 - 3.8.1 Pacific Border Province Page 84
 - 3.8.2 Cascade Mountains Province Page 86
 - 3.8.3 Columbia Plateau Province Page 87
 - 3.8.4 Threatened and Endangered Plant Species Page 88
- 3.9 Federal Treaty and Trust Responsibilities; Tribal Rights and Interests ... Page 88
- 3.10 Environmental Justice Page 90
- 4.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES Page 93
 - 4.1 Introduction Page 93
 - 4.2 Soils Page 93
 - 4.2.1 Alternative 1- No Action Page 93
 - 4.2.2 Alternative 2 - Proposed Action - Approve Routine Road Maintenance Program from Jurisdictions in Washington State Page 100
 - 4.2.3 Alternative 3 - Approve Program Comparable to the Oregon Department of Transportation’s Routine Road Maintenance Program Page 100
 - 4.2.4 Alternative 4 - Approve the Routine Road Maintenance Program from Jurisdictions in Washington State but with Targeted Mitigation Measures Page 101
 - 4.3 Air Quality Page 102
 - 4.3.1 Alternative 1 - No Action Page 102
 - 4.3.2 Alternative 2 - Proposed Action - Approve Routine Road Maintenance Program from Jurisdictions in Washington State Page 102
 - 4.3.3 Alternative 3 - Approve Program Comparable to the Oregon Department of Transportation’s Routine Road Maintenance Program Page 102
 - 4.3.4 Alternative 4 - Approve the Routine Road Maintenance Program from Jurisdictions in Washington State but with Targeted Mitigation Measures Page 103
 - 4.4 Water Quantity Page 103
 - 4.4.1 Alternative 1 - No Action Page 103
 - 4.4.2 Alternative 2 - Proposed Action - Approve the Routine Road Maintenance Program from Jurisdictions in Washington State Page 103
 - 4.4.3 Alternative 3 - Approve Program Comparable to the Oregon Department of Transportation’s Routine Road Maintenance Program Page 104
 - 4.4.4 Alternative 4 - Approve the Routine Road Maintenance Program from Jurisdictions in Washington State but with Targeted Mitigation Measures Page 104
 - 4.5 Water Quality Page 105
 - 4.5.1 Alternative 1 - No Action Page 105
 - 4.5.2 Alternative 2 - Proposed Action - Approve Routine Road Maintenance Program Submittal from Jurisdictions in Washington State Page 106

1 4.5.3 Alternative 3 - Approve Program Comparable to the Oregon Department
2 of Transportation's Routine Road Maintenance Program Page 107
3 4.5.4 Alternative 4 - Approve the Routine Road Maintenance Program from
4 Jurisdictions in Washington State but with Targeted Mitigation Measures
5 Page 107
6 4.6 Fish Page 108
7 4.6.1 Native Fish Species; Salmonid ESUs in the July 2000 4(d) Rule; and
8 Threatened and Endangered Fish Species Page 108
9 4.6.1.1 Alternative 1 - No Action Page 108
10 4.6.1.2 Alternative 2 - Proposed Action - Approve Routine Road
11 Maintenance Program from Jurisdictions in Washington
12 State Page 109
13 4.6.1.3 Alternative 3 - Approve Program Comparable to the
14 Oregon Department of Transportation's Routine Road
15 Maintenance Program Page 111
16 4.6.1.4 Alternative 4 - Approve the Routine Road Maintenance
17 Program from Jurisdictions in Washington State but with
18 Targeted Mitigation Measures Page 111
19 4.6.2 Aquatic Habitat Page 112
20 4.6.2.1 Alternative 1 - No Action Page 112
21 4.6.2.2 Alternative 2 - Proposed Action - Approve Regional
22 Routine Road Maintenance Program from Jurisdictions in
23 Washington State Page 113
24 4.6.2.3 Alternative 3 - Approve Program Comparable to the
25 Oregon Department of Transportation's Routine Road
26 Maintenance Program Page 113
27 4.6.2.4 Alternative 4 - Approve the Routine Road Maintenance
28 Program from Jurisdictions in Washington State but with
29 Targeted Mitigation Measures Page 114
30 4.7 Wildlife Page 114
31 4.7.1 Birds, Land Mammals, and Herpetofauna Page 114
32 4.7.1.1 Alternative 1 - No Action Page 114
33 4.7.1.2 Alternative 2 - Proposed Action - Approve Routine Road
34 Maintenance Program Submittal from Jurisdictions in
35 Washington State Page 115
36 4.7.1.3 Alternative 3 - Approve Program Comparable to the
37 Oregon Department of Transportation's Routine Road
38 Maintenance Program Page 115
39 4.7.1.4 Alternative 4 - Approve Routine Road Maintenance
40 Program from Jurisdictions in Washington State but with
41 Targeted Mitigation Measures Page 116
42 4.7.2 Threatened and Endangered Wildlife Species Page 116

1 4.7.2.1 Alternative 1 - No Action Page 116
2 4.7.2.2 Alternative 2 - Proposed Action - Approve Routine Road
3 Maintenance Program from Jurisdictions in Washington
4 State Page 116
5 4.7.2.3 Alternative 3 - Approve Program Comparable to the
6 Oregon Department of Transportation's Routine Road
7 Maintenance Program Page 117
8 4.7.2.4 Alternative 4 - Approve the Routine Road Maintenance
9 Program from Jurisdictions in Washington State but with
10 Targeted Mitigation Measures Page 117
11 4.8 Vegetation Page 118
12 4.8.1 Alternative 1 - No Action Page 118
13 4.8.2 Alternative 2 - Proposed Action - Approve Routine Road Maintenance
14 Program Submittal from Jurisdictions in Washington State Page 118
15 4.8.3 Alternative 3 - Approve Program Comparable to the Oregon Department
16 of Transportation's Routine Road Maintenance Program Page 119
17 4.8.4 Alternative 4 - Approve the Routine Road Maintenance Program from
18 Jurisdictions in Washington State but with Targeted Mitigation Measures
19 Page 119
20 4.9 Federal Treaty and Trust Responsibilities; Tribal Rights and Interests - All
21 Alternatives Page 120
22 4.10 Environmental Justice - All Alternatives Page 120
23
24 5.0 CUMULATIVE IMPACTS Page 121
25
26 6.0 REFERENCES Page 130

TABLES

1
2
3 Table 1. The 10 salmon and steelhead evolutionarily significant units (ESUs) included in
4 this EA and their listing information. Page 2
5 Table 2. Comparison of best management practices (BMPs) included under each of the
6 four alternatives. Page 33
7 Table 3. Population for Washington, the analysis area, and selected major cities in the
8 analysis area in 2000. Page 51
9 Table 4. Population of five counties in the analysis area. Page 52
10 Table 5. Current air quality status in the analysis area for particulate matter. Page 57
11 Table 6. Over-appropriated basins in the analysis area where flow is critical to salmonid
12 recovery. Page 61
13 Table 7. Major dams restricting fish access to habitat in the analysis area. Page 63
14 Table 8. Percent imperviousness for various land use types in Pierce County, Washington.
15 Page 64
16 Table 9. Stream miles in Washington out of compliance with water quality standards.
17 Page 65
18 Table 10. Number of water bodies not meeting water quality standards in Washington.
19 Page 66
20 Table 11. Water bodies out of compliance with water quality standards in the analysis area.
21 Page 67
22 Table 12. Selected waterbodies and corresponding pollutants on 303(d) list in analysis area.
23 Page 69
24 Table 13. A partial list of the wildlife species inhabiting the analysis area. Page 82
25 Table 14. Percent ethnicity in 2000 in the 28 counties that intersect the analysis area.
26 Page 91
27 Table 15. Unemployment rates for metropolitan areas in the analysis area. Page 92
28 Table 16. Summary of potential environmental impacts associated with each alternative.
29 Page 94
30 Table 17. Summary of past, current, and future programs and the ESUs affected by these
31 programs. Page 127

FIGURES

1

2

3 Figure 1. Analysis Area for NEPA Limit 10 Sequential EA Page 48

4 Figure 2. Analysis Area and Geographic Extent of ESUs in July 2000 4(d) Rule . . Page 49

5 Figure 3. Washington State Soil Erodibility in the Analysis Area Page 54

6 Figure 4. PM10 Attainment Status in the Analysis Area Page 56

7 Figure 5. Rivers, Streams, and Accessibility to Anadromous Salmonids Page 58

8 Figure 6. State Designated Water Resource Inventory Areas in the Analysis Area . Page 59

9 Figure 7. 1998 303(d) Listed Waterbodies in the Analysis Area Page 68

10 Figure 8. Exceedences of State Water Temperature Standards in Analysis Area . . . Page 71

11 Figure 9. Exceedences of State Dissolved Oxygen Standard in Analysis Area Page 74

12 Figure 10. Ecoregions in the Analysis Area Page 80

13 Figure 11. Vegetation in the Analysis Area Page 85

14

15

APPENDICES

- 16
- 17
- 18 A. Description of Ecoregions that Intersect with the 10 ESUs
- 19 B. Federally Listed Threatened and Endangered Species – Washington
- 20 C. Tribal Governments in the Analysis Area
- 21 D. Percent Ethnicity by County Intersecting the Analysis Area

1.0

**PURPOSE AND
NEED FOR THE
PROPOSED ACTION**

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

Twenty-five jurisdictions in the State of Washington have submitted a joint routine road maintenance Program (RRM Program) to the National Marine Fisheries Service (NOAA Fisheries) for approval under Limit 10 of the Endangered Species Act (ESA) section 4(d) rule. Approval under Limit 10 would ensure that in conducting RRM activities, the 25 Washington jurisdictions would not be subject to ESA section 9 take prohibitions because these activities would be managed to avoid or minimize the risk of take to listed threatened salmonids. Such approval would cover a range of routine road maintenance (RRM) activities, but would not include new construction actions. The geographic areas to be covered are located in Asotin, Benton, Clallam, Clark, Columbia, Cowlitz, Franklin, Garfield, Island, Jefferson, King, Kitsap, Kittitas, Klickitat, Lewis, Mason, Pacific, Pierce, San Juan, Skagit, Skamania, Snohomish, Thurston, Wahkiakum, Walla Walla, Whitman, and Yakima Counties in Washington. Maintenance activities would be conducted in 10 threatened salmon and steelhead evolutionarily significant units (ESUs) (Table 1).

There are approximately 38,583 centerline miles of road within the geographic area of the 10 listed ESUs of which approximately 15,006 miles are managed by the 25 jurisdictions that submitted the Part 3 Limit 10 RRM Program application to NOAA Fisheries. RRM activities are scheduled or are predictably recurring activities needed to maintain the functional integrity of the right-of-way structure¹ (Washington Department of Transportation 2000). RRM activities protect public safety, public infrastructure, and the services necessary for the daily operation of the road way system. RRM activities can include (among others) pavement maintenance; patching potholes and sealing roadway cracks; snow and ice control such as sanding, plowing, and anti-icing; pavement marking and guidepost maintenance; maintaining roadsides, stormwater systems, utility systems and road shoulders; vegetation management; bridge maintenance and operations; repairing guard rails and fences; cleaning ditches and culverts; maintaining lighting and traffic signal systems; and safety patrol for roadside debris. Maintenance of right-of-way structures is essential; it protects the public investment in the safety infrastructure and the environment. In carrying out these activities, road maintenance personnel use best management practices, which are physical, structural, and managerial practices designed so that when they are used (singularly or in combination) they reduce the activities' impacts on water and habitat.

¹ The right-of-way structure is the area of land dedicated for public use or secured by the public for purposes of ingress and egress to abutting property and other public purposes (subsection 2.4, Alternative 2: Proposed Action, Maintenance and the Right-of-Way).

RRM activities are carried out on roads in urban and rural areas. Cities, counties, ports, Tribal governments, and the Washington Department of Transportation conduct RRM activities throughout the year. These activities have the potential to affect riparian habitat, instream conditions, and water quality within the threatened ESUs.

To obtain approval by NOAA Fisheries for implementing an RRM Program under Limit 10, the 25 jurisdictions must prepare a Program that meets the performance criteria defined under Limit 10 of the 4(d) rule (subsection 1.2, ESA 4(d) Rule). Accordingly, the jurisdictions have prepared an RRM Program in support of its approval request. This RRM Program submitted by jurisdictions in Washington State is hereby incorporated by reference (Regional Road Maintenance Technical Working Group 2002).

The Federal action of approving the RRM Program under Limit 10 requires environmental review under the National Environmental Policy Act (NEPA). This environmental assessment (EA) was prepared to meet NOAA Fisheries' environmental documentation requirements under NEPA, and is a sequential review based on the Limit 10 Programmatic EA (NOAA Fisheries 2002) (subsection 1.4, Environmental Review Process). This EA evaluates the environmental consequences associated with the RRM Program submitted by the 25 Washington State jurisdictions, as well as other three alternatives to the proposed RRM Program (including the No Action Alternative).

Table 1. The 10 salmon and steelhead evolutionarily significant units (ESUs) included in this EA and their listing information.

Evolutionarily Significant Unit (ESU)	Listing Status
Puget Sound Chinook Salmon ESU	Listed as a threatened species on March 24, 1999.
Lower Columbia River Chinook Salmon ESU	Listed as a threatened species on March 24, 1999.
Upper Willamette River Chinook Salmon ESU	Listed as a threatened species on March 24, 1999.
Ozette Lake Sockeye Salmon ESU	Listed as a threatened species on March 25, 1999.
Hood Canal Summer-run Chum Salmon ESU	Listed as a threatened species on March 25, 1999.
Columbia River Chum Salmon ESU	Listed as a threatened species on March 25, 1999.
Upper Willamette River Steelhead ESU	Listed as a threatened species on March 25, 1999.
Middle Columbia River Steelhead ESU	Listed as a threatened species on March 25, 1999.
Snake River Basin Steelhead ESU	Listed as a threatened species on August 18, 1997.
Lower Columbia River Steelhead ESU	Listed as a threatened species on March 19, 1998.

Source: 65 FR 42422.

1.1.1 ESA 4(d) Rule and Limit 10

Salmon and steelhead trout species in Washington have been in decline for years. Since 1992, nearly 30 ESUs² of these species have been listed as threatened or endangered under the ESA in Idaho, Washington, Oregon, and California.

Section 9 of the ESA imposes take prohibitions on species listed as endangered. However, section 4(d) of the ESA states that whenever a species is listed as threatened, the Secretary “shall issue such regulations as he deems necessary and advisable to provide for the conservation of the species.” Such protective regulations may include any or all of the prohibitions that apply automatically to protect endangered species under ESA section 9(a)(1). Those section 9(a)(1) prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to *take* endangered species (that is, harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any wildlife species listed as endangered, without written authorization).

Between 1997 and 1999, NOAA Fisheries listed 14 ESUs of salmon and steelhead as threatened under the ESA, but did not immediately invoke the ESA section 4(d) protections. In July 2000, NOAA Fisheries promulgated 4(d) rules for the 14 threatened ESUs accompanied by a set of “limits” on the application of the ESA section 9 take prohibitions provided that the specified categories of activities contribute to conserving listed salmonids (65 FR 42422).

NOAA Fisheries’ Northwest and Southwest regions have determined that the section 9 take prohibitions can be invoked with limited exceptions. NOAA Fisheries, therefore, implemented a mechanism whereby entities can be assured that an activity they are conducting or permitting is consistent with ESA requirements and avoids or minimizes the risk of take of listed threatened salmonids. When such a program contributes to conservation for listed salmonids, NOAA Fisheries does not find it necessary and advisable to apply ESA section 9(a)(1) take prohibitions to activities governed by those programs. Under such limits to the section 9 take prohibitions, these categories of human activities must contribute to conservation for listed salmonids and their habitat. NOAA Fisheries anticipates that by involving individuals and entities at the local and state program levels, they would become more engaged with salmon and steelhead conservation while providing NOAA Fisheries with additional management tools for conservation of listed salmonids.

NOAA Fisheries sought to design the limit approach to the 4(d) rule to meet the following

²For the purposes of fulfilling the mandates of the ESA, NOAA Fisheries treats ESUs as “species” as the Act defines the term “...including any subspecies of fish or wildlife or plants, and any distinct population segment of any species or vertebrate fish or wildlife which interbreeds when mature” (16 U.S.C. § 1531-1544).

1 objectives: 1) ensuring technical feasibility to yield consistent results in conserving listed
2 species, 2) ensuring effectiveness over a broad range of activities to contribute to conserving
3 salmon throughout the Pacific Northwest and California, and 3) developing a user-friendly
4 process to encourage wide acceptance. With these objectives in mind, NOAA Fisheries began to
5 establish categories of actions that could reasonably proceed in a manner that contributes to
6 conservation of listed salmonids, sought concurrence at the national and local levels, and wrote
7 the 4(d) rule that would explain the 4(d) limit approach and delineate the means by which the
8 certain categories of actions could go forward by avoiding or minimizing the risk of take of listed
9 threatened salmonids.

10
11 After proposing the 4(d) rule, NOAA Fisheries held 25 public hearings and attended
12 approximately 100 workshops and meetings with constituents. After examining over 1,500
13 written comments and participating in negotiations and informational sessions NOAA Fisheries
14 produced the 4(d) rule comprising 13 (total) limits on the ESA section 9 take prohibitions (65 FR
15 42422)³. The rule applies to 14 salmon and steelhead ESUs over an area of about 160,000 square
16 miles. As part of the 4(d) rule, NOAA Fisheries did not find it necessary to apply the section 9
17 prohibitions to specified categories of activities that contribute to conserving listed salmonid or
18 are governed by programs that adequately limit impacts on listed salmonids. The limits cover
19 activities from fishery management plans to research programs to habitat restoration activities
20 and, in doing so, creates several new avenues to comply with the ESA. The limits also create a
21 means for NOAA Fisheries to assess possible take impacts over broad areas and sets of actions
22 rather than simply accounting for whether a given activity resulted in direct or indirect take.

23
24 When the 4(d) rules were first promulgated, NOAA Fisheries analyzed the 4(d) rule effects on
25 each ESU in a series of environmental assessments (EAs) under NEPA (NOAA Fisheries 1999a-
26 f). NOAA Fisheries concluded in the EAs that the rules would not have a significant effect on
27 the human environment. The public has demonstrated interest in individual program acceptance
28 under the various 4(d) limits; with increasing interest in using the limits, there is the possibility
29 of increasing effect. Consequently, it is possible that certain limits on the ESA section 9 take
30 prohibitions could have some impacts as defined by NEPA. Thus NOAA Fisheries is conducting
31 this NEPA analysis to determine what possible direct, indirect, and cumulative impacts on the
32 human environment may occur by approving a Limit 10 submittal from the State of Washington.

33
34 Under Limit 10, entities conducting RRM activities (states, cities, counties, ports) would not be
35 subject to the ESA section 9 take prohibitions (with respect to actions implemented under the
36 RRM program) provided that when they perform the RRM actions, they do so using an RRM
37 program that meets the requirements of Limit 10. For NOAA Fisheries to approve an RRM

³At the same time NOAA Fisheries adopted a 4(d) rule for Tribal Resource Management Plans (Tribal Plan) which allows American Indian tribes to qualify for a limit on the take prohibition in cases where the Secretary has determined that implementing the Tribal Plan would not appreciably reduce the likelihood that listed species would survive and recover (65 FR 42481). This EA focuses on the 4(d) rule for salmon and steelhead.

1 program, it must clearly define its intended scope and area of impact and operate under the
2 management objectives and performance indicators defined in Limit 10 of the 4(d) rule. That is,
3 an RRM plan must be consistent with the conservation of the listed salmonids' habitat.
4 This EA evaluates a submittal under the 4(d) rule criteria for Limit 10(ii). RRM programs
5 submitted under Limit 10(ii) must describe how they would assure adequate training, tracking,
6 and reporting, and describe in detail any dust abatement practices requested for ESA coverage. It
7 is important to note that an RRM program approved by NOAA Fisheries would not authorize
8 RRM activities per se'; states, counties, cities, and ports would continue to regulate RRM
9 activities. As such, NOAA Fisheries' approval of an RRM program would simply authorize the
10 program as an ESA-compliant management tool for conserving listed species. Approval of an
11 RRM program would not alter existing local, state, or Federal requirements. States, counties,
12 cities, and ports would continue to regulate and authorize most RRM activities, and any RRM
13 activities that presently require any Federal permits, Federal funding, or other Federal
14 authorization would continue to be subject to the consultation requirements imposed by section 7
15 of the ESA. However, an approved RRM program that meets the Limit 10(ii) criteria would
16 provide an additional method for RRM agencies to execute RRM activities in a manner that
17 avoids possible liability under the ESA while providing NOAA Fisheries with an additional
18 management tool for conserving listed species.

1.2 Purpose and Need for the Proposed Action

1.2.1 Purpose of the Proposed Action

25 The purpose of the Proposed Action is to approve implementation of the RRM Program in 26
26 Washington State jurisdictions⁴ for the continued and necessary routine maintenance of roads in
27 these counties in a manner consistent with ESA compliance. Approval under Limit 10 would
28 provide the jurisdictions with conditional ESA assurances while ensuring a cooperative effort
29 between the jurisdictions and NOAA Fisheries aimed at species conservation. To obtain NOAA
30 Fisheries approval, the Washington jurisdictions have prepared an RRM Program in accordance
31 with the Limit 10 criteria. Program implementation would include adequate training, tracking,
32 and reporting to monitor the effectiveness of the RRM Program at meeting species conservation
33 goals. Modifications to the RRM Program can be requested by NOAA Fisheries to ensure
34 continued compliance with the Limit 10 criteria.

⁴The RRM Program was submitted jointly by the State of Washington through the Washington State Department of Transportation (WSDOT), King, Pierce, Snohomish, Clallam, Kitsap, Mason, and Thurston counties, and the cities of Bellevue, Bremerton, Burien, Covington, Edgewood, Everett, Kenmore, Kent, Lake Forest Park, Lakewood, Maple Valley, Newcastle, Renton, SeaTac, Sammamish, Shoreline, Tacoma, and University Place. Other jurisdictions seeking similar Limit 10 approvals will need their own NEPA and ESA section 7 analyses.

1.2.2 Need for the Proposed Action

Approval of the RRM Program submitted by the 25 jurisdictions is requested because continued RRM activities may, in NOAA Fisheries's opinion, result in take of listed species. The jurisdictions believe that regulations promulgated for the conservation of listed threatened salmonids may curtail RRM operations as currently conducted. Such curtailment could result in impaired road conditions with negative safety and transportation consequences. The jurisdictions, therefore, need a Limit 10 approval for conditional ESA assurances to limit their liability for potential take under ESA section 9.

The needs for the proposed action from the NOAA Fisheries perspective are to: 1) conserve listed species and their habitats while RRM activities are conducted; 2) foster a cooperative effort between the jurisdictions and NOAA Fisheries to ensure species conservation; and 3) to ensure compliance with the ESA, NEPA, and other applicable laws and regulations. The NOAA Fisheries, as well as the 25 Washington jurisdictions, consider implementation of an RRM Program that meets Limit 10 criteria to be an effective means of reconciling the proposed RRM activities with the prohibitions against take and other conservation mandates of the ESA.

1.3 Environmental Review

1.3.1 Process

With respect to the implementation of the 4(d) rule Limit 10 and any RRM programs that might be submitted under that limit, NOAA Fisheries is using a sequential approach to conduct its NEPA reviews. The first review was conducted in the Limit 10 Programmatic EA (National Marine Fisheries Service 2002), which assessed environmental impacts associated with the implementation of Limit 10 as a NOAA Fisheries policy. The Limit 10 Programmatic EA formed the basis for subsequent NEPA analyses by broadly assessing all ESUs that could be impacted by future RRM submittals, and by analyzing the potential impacts of implementing Limit 10 as a policy against the No Action alternative scenario of not implementing a 4(d) rule or associated limit options. The Programmatic EA also compared a Limit 10 policy against the alternative of implementing the 4(d) rule, but without the limit options (NOAA Fisheries 2002).

The second review will be conducted at the program submittal stage. For example, NOAA Fisheries prepared this Limit 10 EA to "tier off" of the larger scale Limit 10 Programmatic EA. In doing so, NOAA Fisheries can compare the broader Limit 10 policy analyses with the specifics set forth in the RRM Program submittal. This allows NOAA Fisheries to determine if the RRM Program will meet the purpose and need for Limit 10 policy implementation as well as potential impacts to ESUs affected by RRM activities conducted by the 25 Washington jurisdictions. The Limit 10 Programmatic EA is hereby incorporated by reference (NOAA Fisheries 2002).

1 **1.3.2 Limit 10 Programmatic EA Findings**

2
3 NOAA Fisheries analyzed and evaluated the following three alternatives for the July 2000 4(d)
4 rule which addressed 14 threatened ESUs, all of which are discussed in detail in the Limit 10
5 Programmatic EA:

6
7 Alternative 1 - No Action: Take no Federal action to implement or enforce the July 2000
8 4(d) rule, which would result in the 14 ESUs still being listed as threatened, but there
9 would be no protective regulations in place to ensure ESA section 9 protections.

10
11 Alternative 2 - Proposed Action (Take Prohibitions with Limits): Implement the July
12 2000 4(d) rule that puts in place the ESA section 9 take prohibitions, and which may limit
13 application of the take prohibitions for RRM programs that meet the Limit 10 criteria
14 defined in the 4(d) rule.

15
16 Alternative 3 - Take Prohibitions with No Limits: Implement the July 2000 4(d) rule
17 ESA section 9 take prohibitions without offering the option to limit the application of the
18 take prohibitions for road maintenance activities.

19
20 The Programmatic EA concluded that the No Action Alternative was determined to have no
21 direct or indirect effects on the environment at the watershed scale and, therefore, its cumulative
22 impact would be equivalent to a continuation of current environmental trends and conditions. At
23 the reach scale, the No Action Alternative could have minor to continued short-term negative
24 effects associated with soils, air quality, the 14 threatened ESUs, fish (not including the 14
25 ESUs), threatened and endangered fish species, threatened and endangered wildlife species,
26 aquatic habitat, vegetation, and environmental justice. These reach scale effects may be minor
27 on an individual basis; however, their cumulative impact on the human environment could
28 potentially be negative for a short period of time. Alternatively, the cumulative impact of the No
29 Action Alternative at the watershed scale may have minor beneficial effects because of ongoing
30 state, local government, and private activities aimed at benefitting elements of the Affected
31 Environment such as water quality conditions and fish habitat. State, local, and private planning
32 efforts include watershed planning, environmental land use zoning, shoreline protection, and
33 habitat conservation plans.

34
35 The Proposed Action was determined to have no direct or indirect negative impacts on land use,
36 geology, physiography, soils, climate, air quality, water quantity, vegetation, salmonid or non-
37 salmonid fish, wildlife, demographic trends, economy, recreation, cultural resources, tribal treaty
38 rights, or environmental justice issues, but it could have some beneficial impacts. The Proposed
39 Action offers the opportunity to pursue RRM activities and avoid possible liability under the
40 ESA and at the same time provide NOAA Fisheries with an additional management tool for
41 conserving listed species. Thus, its cumulative impact would be to add to the ongoing and
42 planned state, local, and private integrated planning efforts that may directly or indirectly benefit

1 these resources. Overall, activities under the Proposed Action would augment past, present, and
2 foreseeable planning efforts within the geographic range of the 14 ESUs and add a conservation
3 tool for protecting these salmon and steelhead populations.
4

5 At the watershed scale, Alternative 3 (Take Prohibitions with No Limits) was determined to have
6 no direct or indirect negative impacts on land use, geology, physiography, soils, climate, air
7 quality, water quantity, vegetation, salmonid or non-salmonid fish and wildlife, demographic
8 trends, economy, recreation, cultural resources, tribal treaty rights, or environmental justice
9 issues, and it could have some beneficial impacts. At the reach scale, Alternative 3 could have
10 impacts similar to the No Action Alternative, which may result in minor to continued negative
11 effects associated with soils, air quality, 14 threatened ESUs, fish (not including the 14 ESUs),
12 threatened and endangered fish species, threatened and endangered wildlife species, aquatic
13 habitat, vegetation, and environmental justice. Similar to the No Action Alternative, these reach
14 scale effects may be minor on an individual basis, however, their cumulative impact on the
15 human environment could potentially be negative over time. At the watershed scale, the
16 environmental impacts associated with Alternative 3 were determined to be similar to the
17 environmental impacts of either the No Action Alternative or the Proposed Action. Therefore, its
18 cumulative impact would be to add to or be equal to the state, local, and private integrated
19 planning efforts that may directly or indirectly benefit these resources.

2.0 ALTERNATIVES

2.1 Introduction

For this EA, NOAA Fisheries conducted internal scoping and augmented the process with issues that arose during the public comment period regarding the July 2000 4(d) rule NEPA compliance (65 FR 42422) and from the public comment period regarding the draft Limit 10 Programmatic EA. In combination, the outcome of these scoping processes revealed the following overall concerns related to the 4(d) rule and the approval of programs under the limits:

1. Conserve listed salmonids and the habitats upon which they depend.
2. Follow the mandates of the ESA (observe the law).
3. Allow people to participate more fully in species conservation and thereby encourage voluntary compliance.
4. Streamline the process for making determinations on RRM programs under the ESA.
5. Develop partnerships with states and local citizens to ensure that future resource activities go forward in a fish-friendly, innovative, and cooperative manner.

The alternatives described below were designed to address these concerns. The best management practices for all alternatives are compared and summarized in Table 2 at the end of this section.

2.2 Alternatives Considered but Eliminated from Detailed Study

No reasonable alternatives were identified beyond those that would meet the purpose and need for the Proposed Action as described below.

2.3 Alternative 1: No Action

Under the No Action Alternative, the RRM agencies would conduct their RRM activities as though no RRM program had been prepared and submitted to NOAA fisheries under the July 2000 4(d) rule Limit 10 for RRM activities. Therefore, the No Action Alternative consists of the basic set of RRM activities that the RRM agencies would conduct in the absence of an RRM program (Table 2). The section 9 prohibitions against taking listed salmonids covered by the July 2000 4(d) rule would be in effect. Those jurisdictions implementing RRM activities under their existing programs would be liable for the take associated with their RRM activities. In addition, section 7 of the ESA would still apply and Federal agencies would be required to consult with NOAA Fisheries on the probable effects of any action in relation to RRM activities. The No Action Alternative, therefore, provides a benchmark or baseline from which to compare the environmental effects of the Proposed Action and other alternatives in this EA.

1 The function and mission of RRM activities under the No Action Alternative would be to
2 preserve, maintain, and operate the road right-of-way structure in a condition that is safe and that
3 retains its original intended use and function (Limit 10 Programmatic EA, subsection 1.2,
4 Purpose of Road Maintenance Activities). RRM programs would be developed to manage the
5 effects of weather, organic growth, deterioration, traffic wear, damage, and vandalism. Examples
6 of RRM activities under the No Action Alternative would include, but would not be limited to:
7

- 8 (1) pavement patching and repairing potholes;
- 9 (2) cleaning ditches and culverts so they retain design capacity for drainage;
- 10 (3) slope repair;
- 11 (4) controlling vegetation so it does not block signs or obstruct intersections;
- 12 (5) maintenance tasks for watercourses, rivers, and streams;
- 13 (6) maintenance tasks for stream crossings and bridges;
- 14 (7) sanding, plowing, and anti-icing for snow and ice removal; and
- 15 (8) maintenance tasks for utilities, stormwater, and drainage systems.

16
17 RRM activities would not apply to construction of new facilities or major expansion of existing
18 facilities. RRM activities would not include development or redevelopment activities. Instead,
19 RRM programs would be performed on the existing road right-of-way structure.
20

21 In contrast to the Proposed Action, RRM activities under the No Action Alternative would not
22 include the following:

- 23 (1) coordinated review of consistency for road maintenance between jurisdictions;
- 24 (2) coordinated training programs;
- 25 (3) coordinated monitoring of RRM activities;
- 26 (4) coordinated communication between road maintenance organizations;
- 27 (5) coordinated adaptive management of RRM best management practices;
- 28 (6) coordinated emergency response practices;
- 29 (7) coordinated reporting and commitment to the use of best management practices; and
- 30 (8) coordinated maintenance tasks for utilities, stormwater, and drainage systems.

31
32
33 Historic trends influencing species' declines within the analysis area due to RRM activities
34 would likely continue under the No Action Alternative where local and state RRM activities
35 would not be modified to protect fish and other resources. Numerous policies and regulations
36 have been established throughout the analysis area to address degradation of fish habitat and fish
37 populations that may improve baseline conditions over time. Additionally, unless there is a
38 section 7 requirement, NOAA Fisheries would not have the management options necessary for
39 involvement in ongoing cooperative conservation with RRM jurisdictions. There would be no
40 mechanism for adaptive management of RRM best management practices (Table 2), regional
41 cooperation, or coordinated training of staff implementing RRM activities in the analysis area
42 under the No Action alternative.

1 Without a Limit 10 (ii) submittal, NOAA Fisheries would not have the authority to evaluate the
2 long-term effectiveness of an RRM program in maintaining and achieving habitat function that
3 provides for conservation of listed salmonids. NOAA Fisheries would not be able to identify to
4 the jurisdictions ways in which the existing programs need to be altered or strengthened. If the
5 existing RRM programs would not protect desired habitat functions, NOAA Fisheries would not
6 have the opportunity to identify desirable changes to on-going RRM activities.
7

8 Finally, this alternative does not provide other ESA options to Washington State beyond the ESA
9 section 7 and section 10 tools to conserve listed ESUs, nor would it foster a cooperative
10 management relationship with the state. Furthermore, the No Action Alternative does not
11 support the NOAA Strategic Plan described in the Limit 10 Programmatic EA, subsection 2.2,
12 Purpose and Need.
13

14 **2.4 Alternative 2: Proposed Action -Approve the Routine Road Maintenance Program** 15 **from Jurisdictions in Washington State** 16

17
18 Under the proposed action, NOAA Fisheries would approve the RRM Program submitted by
19 jurisdictions in Washington State under the July 2000 ESA 4(d) Rule limit 10(ii). The Proposed
20 Action is consistent with the issues identified during NOAA Fisheries' internal NEPA scoping
21 process for this EA, public comment regarding the draft Programmatic Limit 10 EA, and public
22 comments regarding the July 2000 4(d) rule NEPA compliance (subsection 3.1, Introduction in
23 the Programmatic EA)(65 FR 42422). The 10 ESUs in the analysis area are listed as threatened,
24 and the ESA section 9 take prohibitions are in effect, but there would be a limit on their
25 application to activities covered under this RRM Program submittal. Federal agencies, however,
26 would be required to consult with NOAA Fisheries pursuant to section 7 of the ESA for all ESA-
27 related activities.
28

29 For RRM programs to receive NOAA Fisheries' approval, the program would adequately protect
30 fish it must either (1) constitute RRM activities conducted by Oregon Department of
31 Transportation (ODOT) employees (or their agents) that complies with ODOT's *Transportation*
32 *Maintenance Management System Water Quality and Habitat Guide* (July, 1999); or (2) be
33 conducted by the employees or agents of a state, county, city, or port under a program that
34 complies substantially with the ODOT Guide and has been determined to meet or exceed the
35 protections found in the ODOT Guide; or (3) be conducted by the employees or agents of a state,
36 county, city or port in a manner that has been found to contribute to properly functioning
37 condition.
38

39 Limit 10 of the 4(d) rule applies to the RRM program of ODOT outright. The limit also provides
40 two routes for qualification of additional road maintenance programs. The first is provided in
41 section (10)(i) and is based on consistency with ODOT's Guide. The second route is provided in
42 (10)(ii) and requires NOAA Fisheries to find that a RRM program preserves existing habitat

1 function levels, and allows natural progression towards PFC where habitat is impaired.

2
3 In this Proposed Action (Alternative 2), the proposed RRM Program was prepared by the
4 Regional Road Maintenance ESA Technical Working Group⁵ for consideration by NOAA
5 Fisheries under the (10)(ii) criteria in the 4(d) rule. It is designed to contribute to the
6 conservation of salmonids and other fish species and to serve as a consistent program that can be
7 used by any jurisdiction wishing to limit, reduce, or eliminate the prohibition on take of
8 threatened species associated with its program. The RRM Program is comprised of three parts:

- 9
- 10 • **Part 1: Regional Program Elements** is the basic framework for the RRM Program. It
11 includes the ten program elements that make up the RRM Program. The program
12 elements combine policy, management, field practices, and science to form a
13 comprehensive approach to the conservation of listed species. Details of the ten elements
14 are described in the Final Draft of Regional Road Maintenance ESA Program Guidelines
15 (Regional Road Maintenance Technical Working Group, 2002). Those jurisdictions
16 seeking coverage under the July 2000 4(d) Rule must comply with each of the ten
17 program elements:

- 18
- 19 1. **Regional Forum:** A Regional Forum has been created from participating
20 jurisdictions. The Regional Forum provides a regular meeting for ESA Program
21 discussion, coordination, and adaptive management. In terms of contributing to
22 conservation, the Regional Forum provides a process whereby new information
23 gathered by each jurisdiction can be shared with other jurisdictions across the
24 state. Sharing information on successful best management practices applications
25 in the field, together with scientific research, creates a potential for each agency to
26 improve its contribution to conservation over time. Additionally, if a problem
27 with program implementation occurs in one jurisdiction, this information sharing
28 helps reduce repeated problems.
 - 29 2. **Program Review and Approval:** The program review and approval process
30 would require that each jurisdiction participating in the Regional Program comply
31 with the 10 program elements. The Washington State Department of
32 Transportation (WSDOT) Highways and Local Program (H&LP), Headquarters
33 Office or the Regional Forum, will review each jurisdiction's Part 3 Application
34 to determine whether or not it includes all 10 program elements. The goal of the
35 Program Review and Approval process is to establish consistency across
36 Washington so that conservation can be achieved. NOAA Fisheries would
37

⁵The RRM Technical Working Group was originally comprised of the cities and counties participating in the Tri-County ESA Response Forum. The Working Group grew to include road maintenance agencies from Washington State Department of Transportation and other local governments not in the Tri-County group, including Clallam, Kitsap, Mason, Skagit and Thurston Counties and the City of Mount Vernon.

1 determine that each jurisdiction meets the requirements under Limit 10(ii).
2

3 3. **Training:** Courses would include the topics of basic ESA information, design,
4 biological review, permit activities, maintenance of best management practices,
5 and monitoring work activities. The goals of training are to ensure that workers,
6 technical staff, and decision makers a) understand the RRM Program; and b) are
7 aware of their roles and responsibilities. The WSDOT Technology Transfer (T2)
8 Center, the University of Washington Civil Engineering (CE) Professional
9 Development Program (Transpeed), in conjunction with the Regional Forum,
10 would develop a curriculum that may be taught by University of Washington
11 instructors or other trained trainers. Thorough training on all elements of the
12 RRM Program, at applicable levels within the RRM agencies, provides
13 consistency across the State in implementation of the RRM Program so that ESA
14 conservation goals can be met.
15

16 4. **Compliance Monitoring:** The objective of compliance monitoring is to evaluate
17 program implementation to accomplish regional RRM Program conservation
18 goals consistently across the state. Compliance monitoring would take place at
19 several levels: local agency supervisory staff, local jurisdiction permitting
20 authorities, and state and Federal permitting authorities evaluating best
21 management practices for use and implementation. Each local jurisdiction would
22 establish a formal compliance monitoring program for monitoring best
23 management practices outcomes and any monitoring that is part of various
24 research projects.
25

26 5. **Scientific Research:** Case studies in the field, as well as literature research of
27 studies done by others, are included in this program element. The scientific
28 research element would serve to verify the effectiveness of best management
29 practices, and to update best management practices based on latest technologies.
30 Using information derived from scientific research will allow conservation
31 opportunities to be maximized.
32

33 6. **Adaptive Management:** The adaptive management philosophy would apply to all
34 10 elements of the RRM Program. Adaptive management is a process for
35 gathering and analyzing information to develop and implement alternatives that
36 correct unproductive best management practices. The training, research,
37 biological data collection, and program monitoring elements are a basis for
38 adaptive management. Adaptive management provides a means by which
39 potential adverse impacts are avoided and minimized, and conservation
40 opportunities are maximized as the RRM Program is implemented throughout the
41 State of Washington.
42

- 1 7. **Emergency Response:** This element provides a framework under which road
2 maintenance organizations can operate during emergencies. This program
3 element allows for necessary emergency response measures, while keeping
4 NOAA Fisheries and regulatory agencies informed.
- 5 8. **Biological Data Collection:** This element includes habitat location information
6 within the right-of-way and the development of a process to train and alert staff
7 where the Guidelines need to be applied.
- 8 9. **Biennial Reports:** The Regional Forum would provide biennial (every two years)
9 reports to the Services. Biennial Reports would include a review of the ten
10 program elements, updates on research, recommended best management practices
11 changes, and recommended updates on each program element. In addition to the
12 biennial reports, the Services would be provided copies of the quarterly
13 newsletter.
- 14 10. **Best Management Practices and Conservation Outcomes:** Best management
15 practices and desired conservation outcomes have been developed for RRM
16 activities. Under the RRM Program, best management practices and desired
17 conservation outcomes have been developed for RRM activities. The Regional
18 Forum would annually review and update the best management practices. Local
19 RRM agencies and NOAA Fisheries would review the changes the Regional
20 Forum recommends for adoption.

21
22
23
24
25 • **Part 2: Best Management Practices** are a set of site-specific best management practices
26 for RRM activities. Under the RRM Program environmental and engineering design staff
27 can use these best management practices, in addition to routine best management
28 practices presented in Part 1 to achieve conservation outcomes identified in the RRM
29 Program. Best management practices would be selected based on worksite conditions
30 and to achieve the conservation outcome objectives identified in the Program. State
31 regulations and local ordinances or site-specific permit conditions may all dictate use of
32 specific best management practices. For that reason, Part 2 offers a menu of possible best
33 management practices from which the most suitable method can be selected.
34 In spite of the outcome-based approach; on occasions problems may occur at the
35 worksite, reducing the effectiveness of the best management practices. The RRM
36 Program recognized that risk and built in a method to improve best management practices
37 over time in order to avoid errors, or best management practices failures, and minimize
38 impacts if errors or failures occur. This is accomplished by combining program elements
39 numbers one through nine with program element ten, best management practices, and
40 conservation outcomes. Program elements one through nine work together to help to
41 minimize the risk of adverse habitat impact.

1 Local ESA teams and the Regional Forum would use the principles of adaptive
2 management to evaluate information gathered during the course of maintenance activities,
3 best management practices implementation, monitoring, and scientific research. Based
4 on this evaluation, Part 3 Applications would be updated at the local level and the
5 Regional Program Guidelines would be updated at the regional level. The Regional
6 Forum produces recommended program changes which are submitted to NOAA Fisheries
7 for final review and approval. If NOAA Fisheries has questions or concerns, these are
8 referred back to the Regional Forum for resolution. Final program changes, as approved
9 by NOAA Fisheries, would be used to update the Regional Program Guidelines.

- 10
11
12 • **Part 3: Application** is an individual jurisdiction's 4(d) application under the RRM
13 Program. The Part 3 application allows local jurisdictions to implement Parts 1 and 2 of
14 the Program to receive a take limit under Limit 10(ii) of the 4(d) rule. The Part 3
15 Application is a specific commitment that a jurisdiction would comply with the 10
16 program elements in Part 1.

17
18 The proposed RRM Program does not apply to the construction of new facilities or major
19 expansion of existing facilities. It does not include development or redevelopment activities.
20 Instead, the RRM Program encompasses road maintenance work performed on the existing right-
21 of-way structure.

22 23 24 **Maintenance and Right of Way Structure**

25
26 Only activities that fall under the definition of "maintenance" are covered under the RRM
27 Program. Below is the definition of "maintenance."

28
29 Maintenance : Repair and maintenance include activities that :

- 30 (1) are conducted on currently serviceable structures, facilities, and equipment;
- 31 (2) involve no expansion of or change in use of such structures, facilities, and
32 equipment beyond those that existed previously;
- 33 (3) do not result in substantial negative hydrological impact.

34
35 Repair and maintenance include those usual activities taken to prevent a decline, lapse, or
36 cessation in the use of structures and systems or to replace dysfunctional facilities. Repair and
37 maintenance also include replacing existing structures with different types of structures, provided
38 that replacement is required to meet current engineering standards or by one or more permits and
39 the functioning characteristics of the original structure are not changed. An example would be
40 replacing a collapsed, fish-blocking round or wooden culvert with a new box culvert under the
41 same span or width of roadway.
42

1 Right-of-Way Structure is the area of land dedicated for public use or secured by the public for
2 purpose of ingress or egress to abutting property and other public purposes. Right -of-way
3 structures include planned, designed, engineered, and constructed features that together
4 encompass many built systems. Typical right-of-way structures include, but are not limited to,
5 the following:

- 6 • open drainage system/sediment transport system
- 7 • closed drainage system/sediment transport system
- 8 • retention/detention surface/drainage and sediment transport system
- 9 • utilities
- 10 • stream system
- 11 • right-of-way itself, width, air space above, and underground.

12
13 Road maintenance activities are organized in the proposed RRM Program under the following 15
14 Maintenance Categories:

15
16 **1. Roadway Surface:** The roadway surface is part of the right-of-way structure. The slope of
17 the roadway surface routes water and sediments off the roadway to the shoulder, ditch, or
18 enclosed drainage system. Thus, the slope of the roadway surface is part of the water
19 flow and sediment collection systems. Maintenance activities would include pothole and
20 square cut patching; removing paved surfaces; repairing roadway base; repaving; adding
21 gravel or grading surfaces; dust control; extending pavement edge; paving graveled
22 shoulder; crack sealing overlay; chip seal; resurfacing; pavement marking and traffic
23 channelization; and traffic control features.

24
25 Best management practices proposed for maintaining, repairing, installing or replacing
26 roadway surfaces were designed to maximize opportunities for increased infiltration;
27 reduce runoff of site pollutants, debris and sediments; and protect the watercourse, stream
28 and/or water body; maximize opportunities for increased infiltration; and reduce run-off
29 of dirt, debris, sediment, and petroleum products from maintenance activities to
30 contribute to maintaining water quality.

31
32 **2 and 3. Enclosed Drainage Systems and Cleaning of Enclosed Drainage Systems:** The
33 enclosed drainage system is part of the right-of-way structure that routes water and
34 sediments from roadways and surface structures through water and sediment collection
35 systems to outlet areas. Enclosed drainage systems, which are used for water quality and
36 quantity treatment, are designed to accumulate sediments over time. Because of limited
37 storage capacity, this sediment should be removed to maintain treatment effectiveness
38 and environmental protection. The purposes for repair, replacement, installation,
39 cleaning and maintenance tasks on enclosed drainage systems includes removing large
40 quantities of sediments and debris from storm water before it enters watercourses or
41 streams; ensuring the roadway drainage system removes, collects and conveys water from
42 the Right- of-way to permit the maximum use of the roadway; reducing damage to

1 roadway structures; protecting the abutting property from damages; restoring surface
2 water drainage; and maintaining structural integrity.

3
4 Best management practices proposed for maintaining, repairing, installing, and replacing
5 enclosed drainage systems were designed to protect receiving bodies of watercourses,
6 streams, and/or waterbodies; reduce work site pollutants; and to maintain water quality.
7 System cleaning, maintenance, and repairs reduce pollutant and sediment transport from
8 system breaks; and control the storage, delivery, and routing of surface and ground water
9 to control volumes and velocities of stormwater discharge by cleaning and maintaining
10 the system.

11
12 **4. Open Drainage Systems:** Like the enclosed system, the open drainage system is part of the
13 right-of-way structure that routes water and sediments from roadways and surface
14 structures through water and sediment collection systems to outlet areas. Open drainage
15 systems include stormwater conveyance systems that were created entirely by artificial
16 means, such as roadside ditches and storm or surface water run-off facilities. These
17 structures are not watercourses, streams, and/or wetlands. Maintenance tasks would
18 involve activities such as cleaning, reshaping/regrading, erosion control/bank
19 stabilization, vegetation management, removal of debris, trash, yard waste and sediments,
20 and repair of structures. These tasks would be performed on retention/detention facilities,
21 swales, pollution control devices, manholes, catch basins, vaults, pipes, culverts, ditches,
and inlets/outlets.

22
23
24 The open drainage system allows sediments to separate and settle from the water flow,
25 thus cleaning and removing large quantities of sediments out of the storm water systems.
26 Maintenance operations would be performed when sediment, debris, or vegetation in a
27 open systems impedes flows or storage of water and sediments to a point where safety or
28 structural integrity of the roadway system is jeopardized.

29
30 Best management practices proposed for maintaining, repairing, and cleaning open
31 drainage systems were designed to protect down stream habitat, protect water quality,
32 reduce work site pollutant runoff to watercourses, streams, and/or waterbodies; maintain
33 or restore the storage, delivery, and routing of surface and groundwater; to control
34 volumes and velocities of discharge by removing sediment loading from drainage system;
35 and maintain or restore biofiltration, shading, and bank stabilization.

36
37 **5. Watercourses and Streams:** Watercourses, rivers, and/or streams refer to any portion of a
38 channel, bed, bank, or bottom waterward of the ordinary high water line of the waters of
39 the state. This definition includes areas in which fish may spawn, reside, or through
40 which they may pass, and tributary waters with defined bed or banks, which influence the
41 quality of fish habitat downstream (WAC 220-110-020(83)). This includes watercourses
42 that flow on an intermittent basis or that fluctuate in level during the year and applies to

1 the entire bed of the watercourse whether or not the water is at peak level. This definition
2 does not include irrigation ditches, canals, stormwater runoff devices, or other entirely
3 artificial watercourses, except where they exist in a natural watercourse that has been
4 altered by humans.

5
6 Some roadside ditches and/or stormwater facilities can be watercourses or streams.
7 Proposed maintenance activities within waters of the state would be reviewed prior to
8 work with the Washington State Department of Fish and Wildlife (WDFW) staff to
9 ensure Hydraulic Project Approval (HPA) compliance.

10
11 Maintenance tasks would involve activities such as structural repair/replacement, slope
12 stabilization, sediment removal, vegetation management, debris removal, and habitat
13 maintenance/improvements (such as fish ladders, weirs, and large woody material). Best
14 management practices proposed for the maintenance of watercourses and streams were
15 designed to protect habitat and water quality; reduce worksite pollutant runoff to
16 receiving watercourse, streams, and /or waterbodies; maintain or restore the storage,
17 delivery, and routing of surface of surface and ground water to control volumes and
18 velocities of discharge by removing sediment loading from the drainage system; and
19 identify chronic sediment deposit problem sites that require frequent sediment removal.

20
21 **6. Stream Crossings:** Stream crossing includes the maintenance, cleaning, installation,
2 replacement and upgrade of pipes, arch pipes, box culverts, fish ladders, weirs, sediment
3 pools and bridges. Maintenance is conducted to prevent flooding or catastrophic road
4 failure. Flooding and road failures can occur from structures filled to capacity, blocked
5 with debris, or damaged. Maintenance within waters of the State would require hydraulic
6 project approval compliance.

7
8 Best management practices proposed for maintaining stream crossings were designed to
9 repair, replace, or maintain structure; protect habitat, watercourse, or stream while
10 performing maintenance; reduce worksite pollutant runoff; and restore or maintain fish
11 passage. In some cases, habitat restoration work is possible as part of a road maintenance
12 activity. In many cases, this type of work is beyond the scope of RRM activities, but
13 might be done as a capital improvement project or a major restoration project. Whether
14 done on a small scale as part of a maintenance activity, or on a more substantial level as a
15 capital improvement project, the above best management practices would apply where
16 right-of-way is available and to the extent that design/habitat considerations allow.

17
18 **7. Gravel Shoulders:** Maintenance activities on gravel shoulders would be performed to ensure
19 the shoulder functions as a filter for sediments, provides biofiltration, and controls surface
20 water runoff. Maintenance activities would include the removal of sediment, sod, and
21 debris from the shoulder, vegetation control to maintain adequate site distances, and the
22 smoothing of ruts.

1 Best management practices proposed for maintaining gravel shoulders were designed to
2 protect watercourses, streams, and other waterbodies, reduce sediment and debris
3 introductions into watercourses, control the storage, delivery, and routing of surface and
4 groundwater to control volumes and velocities of stormwater discharge by cleaning and
5 maintaining shoulders for sheet flow and infiltration, restore or maintain water quality,
6 reduce turbidity, maximize opportunities for increased infiltration and/or biofiltration,
7 reduce spills, and reduce road surface flooding.

8
9 **8. Street Surface Cleaning:** Street surface cleaning activities would be performed to provide a
10 safe roadway surface. Sweeping reduces sediment loading of the drainage system,
11 surface waters, watercourses, streams, and other water bodies. Water spray systems
12 would be used on sweepers to reduce dust, and pickup sweepers would remove materials
13 from the roadway.

14
15 Best management practices proposed for street surface cleaning were designed to restore
16 or preserve water quality, protect watercourses, streams, and other water bodies by
17 performing maintenance; reduce sediment transport and loading of drainage systems,
18 watercourses or streams, or other water bodies.

19
20 **9. Bridge Maintenance:** Bridge repair, replacement, installation, and maintenance activities
21 were performed to provide a safe roadway and to protect bridge infrastructure according
22 to local, state, and federal regulations. Maintenance activities would include inspecting,
23 testing, repairing, replacing, painting, or resurfacing various components of the bridge.
24 Activities requiring a habitat project approval would be reviewed by the Washington
25 Department of Fish and Wildlife and permitted prior to work activities.

26
27 Best management practices proposed for bridge maintenance were designed to contribute
28 to the restoration and/or enhancement of aquatic habitat, control worksite pollutant
29 runoff, maintain or restore fish passage through structure, maintain or restore water
30 quality off bridges by maintaining drainage systems; repair, replace, or maintain structure;
31 maintain habitat and watercourse or stream by performing maintenance; reduce flooding,
32 and preserve or restore watercourse or stream velocities impaired by blockages in the
33 vicinity of bridge maintenance activity.

34
35 **10. Snow and Ice Control:** Snow and ice control activities would be performed to provide a
36 safe roadway. Sanding and plowing operations are considered to be work of such
37 importance that they are classified as emergency operations and take precedence over all
38 non-emergency work. Post event clean-up is considered a continuation of the activity.

39
40 Best management practices proposed for snow and ice control were designed to provide a
41 reasonably safe roadway surface for the traveling public, reduce salt and other chemicals
42 from entering water bodies, reduce sediment loadings to sensitive areas, reduce the

1 occurrence of vehicles from leaving the road surface, and minimize pollutants resulting
2 from vehicle accidents such as petroleum and hydrocarbon products, heavy metals, and
3 road washoff from entering storm drainage and stream systems.
4

5 **11. Emergency Slide/Washout Repair:** Slides and washouts are caused by the impact of heavy
6 rainfall or freeze and thaw conditions on unstable and/or saturated soils. Slides and
7 washouts may occur on the slope above or below roadways, private property, or sensitive
8 areas. Slide or washout repair activities may include the removal of slide/washout
9 material from the right-of-way, backfilling or restabilizing the slope, reestablishment of
10 damaged roadway features, repairing and cleaning the drainage system, revegetation, or
11 armoring with rock. The initial response to emergencies relating to slide and washout
12 repair is covered under Program Element 8, Emergency Response. After the emergency
13 is stabilized, the repair work would be covered under this maintenance category.
14

15 Best management practices proposed for emergency slide/washout repairs were designed
16 to reduce erosion and sedimentation; to restore water quality, control sediment loading
17 from the right-of-way; contribute to the restoration of aquatic habitat within the right-of-
18 way, encourage revegetation to stabilize slopes, and provide riparian habitat; stabilize the
19 slide/washout area within the right-of-way to reduce environmental impacts; maintain or
20 restore the storage, delivery, and routing of surface and groundwater in order to control
21 flow rate and velocity of discharge by restoring the damaged structure; and reduce debris
22 and pollutants from entering the waterway.
23

24 **12. Maintenance of Concrete Surfaces:** The removal and repair of damaged concrete
25 roadways, sidewalks, driveways, and curb and gutter sections would be performed to
26 provide a safe roadway and pedestrian traffic infrastructure and to maintain adequate
27 conveyance of surface water to drainage systems. Maintenance activities may also
28 involve the installation of new concrete structures.
29

30 Best management practices proposed for concrete maintenance activities were designed to
31 reduce velocities by opening curb cuts when possible, improve surface water drainage and
32 to minimize pollutants from leaving the maintenance or repair area.
33

34 **13. Maintenance of Sewer Systems:** Sewer and storm systems are designed to efficiently
35 collect and remove water from the right-of-way to permit the maximum use of the
36 roadway, prevent damage to roadway structures, to protect abutting property from
37 damages, and to maintain or restore surface water drainage in combined or separate
38 sewer/storm systems. Maintenance is conducted to maintain the integrity of the
39 infrastructure and the operational function, the following systems would be repaired,
40 replaced, installed, and maintained: treatment facilities, lift stations, pump stations, main
41 lines, collection lines, trunk lines, interceptors, lake lines and storage/detention facilities.
42

1 Best management practices proposed for sewer system maintenance activities were
2 designed to protect watercourse and/or stream; reduce work site pollutants to restore or
3 maintain water quality, control the storage, delivery, and routing of surface and
4 groundwater to control volumes and velocities of stormwater discharge by repairing and
5 maintaining sewer system; maximize opportunities for increased infiltration or
6 biofiltration, reduce sediment conveyance from system breaks by maintaining and
7 repairing the sewer system.

- 8
9 **14. Maintenance of Water Systems:** Water system maintenance is conducted to maintain the
10 integrity of the infrastructure, provide additional service and components, maintain
11 operational reliability, and protect health and safety issues. Maintenance activities would
12 be performed on the operating components of the water system facilities, including
13 treatment plants, transmission mains, distribution lines, fire flow systems, reservoirs,
14 tunnels and pump stations, meters, flushing, dewatering, services, and associated rights-
15 of-way or access.

16
17 Best management practices proposed for water system maintenance activities were
18 designed to protect watercourses and/or streams, reduce worksite pollutants to restore or
19 maintain water quality, control the storage, delivery, and routing of surface and
20 groundwater to control volumes and velocities of stormwater discharge by restoring
21 surface after installation, repair, or replacement of underground piping, reduce sediment
22 transport from system breaks by maintaining and repairing system, and where possible
23 debris, maximize opportunities for increased infiltration or biofiltration.

- 24
25 **15. Vegetation:** Vegetation is part of the right-of-way structure. Vegetation maintenance would
26 be conducted in all roadway categories including roadway surface, open and closed
27 drainages, sediment containment, watercourses and streams, stream crossings, shoulders,
28 and utilities. The purpose of vegetation maintenance is to promote, maintain, sustain,
29 manage, or encourage vegetation within the right-of-way to comply with a variety of
30 regulations and standards, including public safety. Vegetation maintenance would
31 improve visibility, surface and subsurface drainage, fire and pollution control, and clear
32 zone area.

33
34 Best management practices proposed for maintaining vegetation were designed to
35 improve drainage by reducing erosion; reducing the spread of noxious weeds and
36 undesirable vegetation; limiting erosion, increasing biofiltration; providing
37 shading/reduce water temperature; suppressing non-desirable vegetation, enhancing
38 desirable vegetation, lowering herbicide use, and providing habitat for macroinvertebrates
39 upon which aquatic species feed. Pesticide and herbicide spraying is not included within
40 Limit 10.

41
42 Prior to approving the RRM Program, or approving any substantive change in the Program,

1 NOAA Fisheries would publish notification in the Federal Register announcing the availability
2 of the Program or the draft changes for public review and comment. Such an announcement
3 would provide for a comment period of not less than 30 days.
4

5 Periodically, NOAA Fisheries would evaluate the approved RRM Program for its effectiveness
6 in maintaining and achieving habitat function that provides for conservation of listed salmonids.
7 When warranted, NOAA Fisheries would identify to the jurisdiction ways in which the Program
8 could be altered or strengthened. Changes may be identified if the RRM Program is not
9 protecting desired habitat functions, or where even with the habitat characteristics and functions
10 originally targeted, habitat is not supporting population productivity levels needed to conserve
11 the ESU. If any jurisdiction within the limit does not make changes to respond adequately to the
12 new information in the shortest amount of time feasible, but not longer than 1 year, NOAA
13 Fisheries would publish notification in the Federal Register announcing its intention to withdraw
14 the limit so that take prohibitions would then apply to the jurisdiction's RRM Program as to all
15 other activity not within a limit. Such an announcement would provide for a comment period of
16 no less than 30 days, after which NOAA Fisheries would make a final determination whether to
17 subject the activities to the ESA section 9(a)(1) take prohibitions.
18

19 Finally, the RRM Program would meet the ESA mandate to provide for the conservation of the
20 listed ESUs. It is important to note that an RRM Program approved by NOAA Fisheries would
21 not authorize RRM activities per se; states, counties, cities, and ports would continue to regulate
22 RRM activities. However, the Limit 10 (ii) criteria would offer an entity an additional option for
23 pursuing RRM activities that avoids possible liability under the ESA while providing NOAA
24 Fisheries with an additional management tool for conserving listed species. It would provide
25 another option to entities in addition to the ESA section 10 tools to conserve listed ESUs and
26 fosters innovative and cooperative management relationships with state, county, city and port
27 entities. It would also streamline the process for making determinations under Limit 10(ii)
28 within Washington State. This alternative supports the NOAA Strategic Plan.
29
30

31 **2.5 Alternative 3: Approve a Program Comparable to the Oregon Department of** 32 **Transportation's Routine Road Maintenance Program** 33

34 Under Alternative 3, NOAA Fisheries would approve an RRM program conducted by a
35 jurisdiction in Washington state that is similar to or complies with the Oregon Department of
36 Transportation (ODOT) *Transportation Maintenance Management System Water Quality and*
37 *Habitat Guide (July 1999)* (Guide). The ODOT's maintenance and environmental staff worked
38 with NOAA Fisheries to develop a RRM program that works well within the mandates of the ESA
39 and the Clean Water Act while carrying out the agency's fundamental mission to provide a safe
40 and effective transportation system. In approving limit 10(i), NOAA Fisheries determined that the
41 program greatly improves protections for listed salmonids by minimizing the impacts that a range
42 of RRM activities have on receiving streams and habitat adjacent to roadways.

1 Alternative 3 is consistent with the issues identified during NOAA Fisheries' internal NEPA
2 scoping process for the Programmatic Limit 10 EA and the issues that arose during the public
3 comment regarding the July 2000 4(d) rule NEPA compliance (65 FR 42422).

4
5 Under section (10)(i), take prohibitions do not apply for programs that are substantially similar to
6 that contained in the ODOT's Guide. To meet this standard, NOAA Fisheries must determine that
7 a proposed program meets or exceeds the protections provided by the ODOT's Guide. Under
8 Alternative 3, any jurisdiction desiring its RRM activities to be within this limit must first commit
9 in writing to apply management practices that result in protections equivalent to or better than those
10 provided by the ODOT's Guide, detailing how it would assure adequate training, tracking, and
11 reporting, and describing in detail any dust abatement practices it requests to be covered.

12
13 To determine that a program is equivalent to or better than ODOT's Guide, a submittal to NOAA
14 Fisheries must include the following:

- 15 1. A cover letter from an appropriate official to the Regional Administrator requesting
16 qualification of the program pursuant to (10)(ii).
- 17
18 2. A detailed description of the program including all covered activities. Identification of the
19 responsible entity and legal authority must be provided.
- 20
21 3. A description of the specific geographic area to which the program applies. A description
22 of the environmental baseline should include migration barriers, structural elements,
23 channel characteristics, water quality, instream flow, riparian condition, and watershed
24 health. Maps are needed to show appropriate data layers.
- 25
26 4. A description of any listed species that may be affected by the activities, and their
27 distribution and status within the program area.
- 28
29 5. Relevant reports, including any environmental impact statement, environmental assessment,
30 or biological assessment prepared; and any other relevant available information on the
31 program, and the affected listed species.
- 32
33 6. A detailed description of how the program would assure adequate training, tracking, and
34 reporting, and a detailed description of any included dust abatement practices.
- 35
36 7. An affirmative conclusion that the program is substantially similar to and at least as
37 protective as ODOT's program in its implementation. This would include a discussion of
38 training, tracking, and reporting necessary to implement and maintain the program. A
39 detailed description of any dust abatement practices would be included.
- 40
41

42 ODOT's Guide covers 26 different types of road maintenance activities including surface work,
43 fish restoration, and winter maintenance of roads. Although included in ODOT's Guide, pesticide

1 and herbicide spraying is not included in this alternative because NOAA Fisheries did not provide
2 ESA coverage for spraying activities in its July 2000 4(d) rule due to the uncertainty in the science
3 regarding the impacts of pesticides and herbicides on salmonids. Public notice and program review
4 procedures would be identical to those described under the Proposed Action.
5

6 The RRM Program under the Proposed Action would be comprised of three parts. Part 1 is the
7 basic model program consisting of 10 program elements. ODOT's program contains many of these
8 elements, which are compared to the Proposed Action below.
9

- 10 1. **Regional Forum:** Because an application under Alternative 3 would be for a single
11 jurisdiction, there is no formal regional forum for this alternative. The Proposed Action
12 describes the Regional Forum that has developed in Washington State to share data and
13 other information, and to participate in adaptive management cooperatively. The Proposed
14 Action is an umbrella program that when adopted by a jurisdiction, requires participation in
15 a Regional Forum, while Alternative 3 has no such need. In addition, a Regional Forum
16 would not occur under the No Action Alternative.
17
- 18 2. **Program Review and Approval by the Regional Forum:** Under Alternative 3, the
19 jurisdiction applying for 4(d) Limit 10 coverage would be a single applicant, and there
20 would be no approval process prior to submission to NOAA Fisheries, other than local
21 approvals required by the jurisdiction to implement its RRM program. Under the Proposed
22 Action, each jurisdiction applying for 4(d) Limit 10 coverage would need to have its Part 3
23 application reviewed to ensure that they comply with the ten program elements. The
24 Washington State Department of Transportation's Highways and Local Programs,
25 Headquarters Offices, or the Regional Forum would review each jurisdiction's Part 3
26 Application to determine whether or not it includes all program elements prior to submittal
27 to NOAA Fisheries. NOAA Fisheries would issue a determination for each agency to
28 receive a take limit. In addition, a program review and approval would not occur under the
29 No Action Alternative.
30
- 31 3. **Training:** Under Alternative 3, the RRM training program would be approved by NOAA
32 Fisheries and would be adequate to assure that the RRM program can be implemented
33 effectively. The training program would contain new employee training, team meetings to
34 discuss best management practices implementation, erosion and sediment control training,
35 hazardous materials training, ESA training, and continuing education classes. Training
36 would include both classroom and on-site training at road maintenance sites. This training
37 program would be similar to the Proposed Action, but would not occur under the No
38 Action alternative.
39
- 40 4. **Compliance Monitoring:** Similar to the Proposed Action, compliance monitoring is
41 included in the RRM Program. Alternative 3 would include a program of performance
42 assessments and outcome assessments, as well as reporting requirements. Reporting
43 requirements include complaint investigations; modifications of or improvements to best

1 management practices; and investigation of illicit discharges. Also included would be an
2 annual inventory of outfalls that fall into the National Pollution Discharge Elimination
3 System program (statewide), QA/QC of the winter maintenance program, sampling of
4 materials for reuse and understanding of disposal issues, individual sampling upon request,
5 and daily inspection of roads. Monitoring reports would be submitted annually.
6 Compliance monitoring would not occur under the No Action Alternative.

- 7
- 8 5. **Scientific Research:** Alternative 3 may include research programs, as appropriate, that
9 monitor the effectiveness or impacts of agency maintenance activities on habitat or water
10 quality. Scientific research would be similar to the Proposed Action, but would not occur
11 under the No Action Alternative.
- 12
- 13 6. **Adaptive Management:** Adaptive management is a key component of Alternative 3,
14 providing a key feedback loop for modifying the program based on the results of the
15 implementation monitoring and compliance monitoring. Adaptive management would be
16 similar to the Proposed Action, but would not occur under the No Action alternative.
- 17
- 18 7. **Emergency Response:** Best management practices under Alternative 3 would include
19 conservation measures that guide staff responses during emergency actions. Emergency
20 response actions would be undertaken to avoid imminent threat to public health or safety,
21 or to public or private property, or serious environmental degradation. Emergency
22 response would be similar to the Proposed Action, but would not occur under the No
23 Action alternative.
- 24
- 25 8. **Biological Data Collection:** Maps and biological data would be included in the RRM
26 program under Alternative 3. Data gathered and shown on the maps would include
27 sensitive resource areas, stream-road crossing, and guidance on where to implement certain
28 best management practices based on proximity to sensitive resources. Other data that may
29 be collected could include habitat quality and quantity in terms of migration barriers,
30 structural elements, channel characteristics, water quality, instream flow, riparian condition,
31 and watershed health. Biological data collection would be similar to the Proposed Action,
32 but would not occur under the No Action alternative.
- 33
- 34 9. **Annual Report:** Instead of biennial reports as under Alternative 2, the reporting schedule
35 for Alternative 3 would be annual. The report would include best management practices
36 modifications, a discussion of challenges or successes in the application of the best
37 management practices, compliance reviews of construction projects, investigations of illicit
38 discharges to rights-of-way or drainage pipes, and a summary of complaints from or by
39 staff, other agencies, or the public on impacts to the environment by maintenance activities.
- 40
- 41 10. **Best Management Practices and Conservation Outcomes:** Under Alternative 3, the
42 jurisdiction would adopt RRM best management practices the same as or more protective
43 than ODOT's (Table 2). ODOT's Guide describes 26 best management practices

1 categories for road maintenance activities. Each best management practice category
2 describes a menu of best management practices that would be implemented depending on
3 the site-specific conditions and the likelihood of achieving the goal of the best management
4 practices. The best management practices would be reviewed and updated annually
5 through the annual monitoring/reporting process under Alternative 3. In addition, ODOT
6 has committed to review the Guide and revise it as necessary, at least every 5 years. The
7 jurisdiction would update or modify its best management practices when ODOT does to
8 maintain coverage under limit 10. The Proposed Action's maintenance categories and
9 best management format are different from those in Alternative 3. The Proposed Action
10 is not tied to a Maintenance Management System. However, the concepts between the
11 Proposed Action and this alternative are similar, but would not occur under the No Action
12 Alternatives.
13

14 **Part 2.** The RRM Program under Alternative 3 would be similar to the Proposed Action in that
15 it would present a menu of best management practices for road maintenance crews, supervisors,
16 environmental support staff, engineering design personnel, and managers. Specific best
17 management practices would be selected based on the site-specific needs and the goals of best
18 management practice implementation. State regulations, local ordinances, or site-specific permit
19 conditions may also dictate the use of specific best management practices. This would not occur
20 under the No Action Alternative.
21

22 **Part 3.** Alternative 3 does not include a Part 3 application. Under the Proposed Action, an
23 individual jurisdiction application for 4(d) coverage could use the predetermined process and
24 best management practices to receive a take limit. If a jurisdiction commits to implement Parts 1
25 and 2 of the program, including the 10 program elements under Part 1, then it could receive a
26 take limit under Limit 10(ii) of the 4(d) rule. ODOT's RRM program does not include this
27 option. However, Limit 10(i) provides take limits for jurisdictions whose RRM program is
28 substantially similar to that contained in the ODOT Guide, as determined by NOAA Fisheries.
29 "Substantially similar" is defined as a program that is determined to meet or exceed the
30 protections provided by the ODOT Guide.
31

32 As with the Proposed Action, Alternative 3 does not apply to the construction of new facilities or
33 major expansion of existing facilities. It is not intended to include development or
34 redevelopment activities. The best management practices encompass RRM work performed on
35 the existing rights-of-way. ODOT's Guide organizes its program into an introduction that
36 contains four program elements, 24 maintenance categories, plus seven appendices that provide
37 further guidance. For each maintenance category, the Guide outlines a menu of best management
38 practices to achieve the goals of the category. The maintenance categories and best management
39 practices under Alternatives 2 and 3 are similar, although there are some categories and best
40 management practices found in each that are not found in the other (Table 2).
41

42 Appendix A through G in the ODOT Guide provide further guidance for best management

1 practices implementation and are listed below.

- 2 • Guidelines for maintaining water quality in snow and ice operations
- 3 • Oregon Department of Fish and Wildlife guideline and criteria for stream-road crossings
- 4 • Oregon guidelines for timing of in-water work to protect fish and wildlife resources
- 5 • Division of State Lands fill/removal permit cross section
- 6 • Guidance for maintenance activities in wetland ditches
- 7 • Guidelines for bridge washing
- 8 • Guidance for emergency high repair

9
10 ODOT has committed to review the Guide and revise it as necessary, or at least every 5 years. In
11 addition, ODOT would annually make any necessary best management practices modifications.
12 As with the Proposed Action, changes may be identified if the Guide is not protecting desired
13 habitat functions, or where even with the habitat characteristics and functions, habitat is not
14 supporting population productivity levels needed to conserve the ESU. If ODOT does not
15 respond adequately to the new information in the shortest amount of time feasible, but not longer
16 than one year, NOAA Fisheries would publish notification in the Federal Register announcing its
17 intention to withdraw the limit so that take prohibitions would then apply to the ODOT RRM
18 program. Such an announcement would provide for a comment period of no less than 30 days,
19 after which NOAA Fisheries would make a final determination whether to subject the activities
20 to the ESA section 9(a)(1) prohibitions. A jurisdiction with coverage under Alternative 3 would
21 also be required to modify its program so that it remains substantially similar to ODOT's
22 program. If a jurisdiction failed to do this, then NOAA Fisheries would withdraw the limit so
23 that take prohibitions under section 9(a)(1) would apply to its RRM program.

24
25 Finally, the RRM program under Alternative 3 would meet the ESA mandate by putting in place
26 the section 9 take prohibitions for the conservation of the listed ESUs. Like the Proposed Action,
27 Alternative 3 would provide an ESA tool to support conservation of listed salmonids in addition
28 to the section 10 tools. This alternative also supports the NOAA Strategic Plan.

30 31 **2.6 Alternative 4 - Approve the Routine Road Maintenance Program from Jurisdictions** 32 **in Washington State but with Targeted Mitigation Measures**

33
34 Under Alternative 4, NOAA Fisheries would approve an RRM program submitted by
35 jurisdictions in Washington State under limit 10(ii). The Alternative 4 program would be the
36 same in structure and substance to the RRM Program described under the Proposed Action, with
37 the addition of targeted mitigation activities. Alternative 4 would be consistent with the issues
38 identified during NOAA Fisheries' internal NEPA scoping process for the Programmatic Limit
39 10 EA and the issues identified in public comments regarding the July 2000 4(d) rule NEPA
40 compliance (Limit 10 Programmatic EA, subsection 3.1, Introduction)(65 FR 42422). Generally,
41 mitigation activities would be added to the RRM Program described under the Proposed Action,
42 addressing short-term losses of ecological function for certain RRM maintenance categories, best

1 management practices, and emergency work, even where those RRM activities contribute (as part
2 of the RRM program) to the long-term attainment and maintenance of properly functioning
3 ecological conditions for the 10 ESUs of threatened salmonids covered by this Limit 10(ii)
4 submittal.

5
6 The Regional Program described under the Proposed Action was prepared by the Regional Road
7 Maintenance ESA Technical Working Group⁶ for consideration by NOAA Fisheries under the
8 (10)(ii) criteria in the 4(d) rule, as described under subsection 2.4, Alternative 2: Proposed
9 Action. It is designed to contribute to the conservation of salmonids and other fish species and to
10 serve as a consistent program that can be used by any Washington jurisdiction wishing to limit
11 the prohibition on take of threatened species associated with its program. The Program would be
12 comprised of three parts: (1) the model program consisting of 10 program elements, (2) the
13 detailed site-specific best management practices for road maintenance crews (Table 2),
14 supervisors, environmental support staff, engineering design personnel and managers, and 3) an
15 application for local jurisdictions to initiate the process of using the RRM Program for its own
16 road maintenance programs.

17
18 The 10 program elements described in Part 1 form the umbrella of the proposed RRM Program
19 under both the Proposed Action and Alternative 4. Details of the 10 elements are described in
20 Final Draft of Regional Road Maintenance ESA Program Guidelines (Regional Road
21 Maintenance Technical Working Group, 2002). Each jurisdiction would implement the Part 3
22 Application within the framework of the RRM Program, according to its own organization
23 structure and resources. The program elements under Alternative 4 would be exactly the same as
24 those described under the Proposed Action (subsection 2.4, Alternative 2: Proposed Action), and
25 those descriptions are incorporated here by reference.

26
27 The best management practices and standards for their selection and use form Part 2 of the RRM
28 Program and would be exactly the same under Alternative 4 as described under the Proposed
29 Action (subsection 2.4, Alternative 2: Proposed Action)(Table 2).

30
31 Finally, as described under the Proposed Action, RRM Program Part 3 is an individual
32 jurisdiction application for 4(d) coverage under the Regional Program. Part 3 allows local
33 agencies to apply Parts 1 and 2 of the Program to receive a take limit under Limit 10(ii) of the
34 4(d) Rule. The Part 3 application is a specific commitment that a jurisdiction would comply with
35 the 10 program elements in Part 1.

36
37 As under the Proposed Action, the RRM program under Alternative 4 would not apply to the

⁶The RRM Technical Working Group was originally comprised of the cities and counties participating in the Tri-County ESA Response Forum. The Working Group grew to include road maintenance agencies from other local governments not in the Tri-County group, including Skagit and Thurston Counties and the City of Mount Vernon.

1 construction of new facilities or major expansion of existing facilities. It is not intended to
2 include development or redevelopment activities. Instead, the RRM program would encompass
3 road maintenance work performed on the existing right-of-way structure, as described under the
4 Proposed Action, subsection 2.4, Alternative 2: Proposed Action.

5
6 The element that distinguishes Alternative 4 from the Proposed Action is the inclusion of
7 targeted mitigation actions for certain activities in the RRM program. Certain elements of Parts
8 1 and 2 call for practices that, as part of the overall program, do not detract from the RRM
9 Program's contribution to the attainment and maintenance of PFC. However, individually these
10 activities can and might cause short-term losses of ecological function. Specifically, certain
11 emergency response work, activities within the watercourses and streams, stream crossings, and
12 vegetation maintenance categories, might call for practices that temporarily inhibit the function
13 of habitat-supporting processes. For example, conducting flood fight bank stabilization with rip-
14 rap can prevent certain channel processes from occurring or cover existing space in the stream
15 margin used by salmonids for spawning, rearing, and refugia, among other things. To avoid the
16 long-term persistence of such detriments, Alternative 4 would include an additional process for
17 assessing practices for potential short-term losses of function and for according mitigation
18 responses to address such losses should they arise.

19
20 To address the residual effects of RRM Program elements that cause short-term loss of
21 ecological function, mitigation activities would be developed as effects are identified (e.g.,
22 during the planning, implementation, and monitoring phases of the proposed RRM activity).
23 Mitigation activities would be designed and prioritized to address the specific lost function as
24 close to the activity as possible, at least within the same stream reach. The function of the
25 proposed mitigation would be to ensure the maintenance and protection of the same habitat
26 creating processes affected by the subject RRM activity, for as long as it takes for those processes
27 to naturally return to their pre-affected condition (and permanently if the effects of the RRM
28 activities cannot be remedied).

29
30 The first step in the assessment process would be to identify the practice and derive a general
31 description of its environmental impacts on the function of certain habitat supporting processes.
32 The assessment would be conducted in the same way the effects analyses was conducted by the
33 Road Maintenance Working Group in the RRM Biological Review. The matrix is provided in
34 the Biological Review to identify the impacts associated with RRM implementation.

35
36 Once the general effects analyses are adequately defined, the second step would identify specific
37 habitat needs that should be addressed in a mitigation action. These needs would be considered
38 in sufficient detail to permit the road maintenance agency to define specific actions that would
39 remedy each need. As part of the assessment process, it would be important to identify data gaps
40 related to habitat effects of the best management practices. These data gaps would be subject to
41 the same information gathering and adaptive management elements already provided in the
42 RRM Program under the Proposed Action.

1 A simple example of appropriate mitigation would be the removal of historic, residual rip-rap
2 from a stream reach in which emergency bank stabilization was conducted under the RRM
3 Program. To address loss of function resulting from the emergency bank stabilization,
4 Alternative 4 would call for replacement of historically placed bank stabilization structures.
5 Where such activities would prevent improvement of affected functions, such structures could be
6 replaced by biologically engineered bank stabilization structures that promote improvement of
7 habitat functional conditions within the RRM Program project area.

8
9 As under the Proposed Action, prior to approving the RRM Program under Alternative 4, or
10 approving any substantive change in the program, NOAA Fisheries would publish notification in
11 the Federal Register announcing the availability of the program or the draft changes for public
12 review and comment. Such an announcement would provide for a comment period of not less
13 than 30 days.

14
15 Periodically, NOAA Fisheries would evaluate the approved program for its effectiveness in
16 maintaining and achieving habitat function that provides for conservation of listed salmonids.
17 When warranted, NOAA Fisheries would identify to the jurisdictions ways in which the Program
18 needs to be altered or strengthened. Changes may be identified if the program is not protecting
19 desired habitat functions, or where even with the habitat characteristics and functions originally
20 targeted, habitat is not supporting population productivity levels need to conserve the ESU. If
21 any jurisdiction within the limit does not make changes to respond adequately to the new
22 information in the shortest amount of time feasible, but not longer than one year, NOAA
23 Fisheries would publish notification in the Federal Register announcing its intention to withdraw
24 the limit so that take prohibitions would then apply to the Program as to all other activity not
25 within a limit. Such an announcement would provide for a comment period of no less than 30
26 days, after which NOAA Fisheries would make a final determination whether to subject the
27 activities to the ESA section 9(a)(1) take prohibitions.

28
29 Finally, an RRM program under Alternative 4 would meet the ESA mandate by putting in place
30 the section 9 take prohibitions to provide for the conservation of the listed ESUs. It would also
31 provide another option to entities beyond the ESA section 10 tools for non-Federal entities to
32 conserve listed ESUs, and would foster cooperative management relationships with state, county,
33 city, and port entities. This alternative also supports the NOAA Strategic Plan.

34
35 As described above, Alternative 4 is similar to the Proposed Action, sharing the same core RRM
36 Program. As such, Alternative 4 shares many of the Proposed Action's differences from the No
37 Action Alternative. As under the Proposed Action, and in contrast to the No Action Alternative,
38 ESA section 9 take prohibitions would be in effect, but there would be a limit on the application
39 of the take prohibitions to activities covered under Alternative 4. Under the No Action
40 Alternative, there would be no such limit on the application the take prohibitions. Further
41 contrasting Alternative 4 from the No Action Alternative, the modification of local RRM
42 activities would be expected to attenuate historic trends in species declines relative to local and

1 state RRM activities. Unlike the No Action Alternative, Alternative 4 would affirmatively
2 complement existing policies, plans, and regulations supporting salmonid habitat conservation,
3 as opposed to relying on them. Finally, unlike the No Action Alternative, state and local RRM
4 agencies would actively seek NOAA Fisheries evaluation and consultation regarding the
5 implementation and effectiveness of RRM Programs under Alternative 4.

6
7 Alternative 4, like the Proposed Action, would provide a structured process for developing
8 approaches to responding to RRM evaluation through the proposed RRM technical forum and
9 adaptive management process embodied in the RRM Program. Compared to the Proposed
10 Action, Alternative 4 provides better short-term protection to address the few RRM practices that
11 may have near-term resource impacts. Yet the risk for permanent long-term impacts to all
12 resources analyzed in this EA is low under either Alternative 4 or the Proposed Action because
13 both alternatives include a full suite of best management practices which, when used over time
14 and implemented together, would offset or minimize the potential for any one RRM action or
15 best management practice to compromise habitat functions and processes. In most cases, over
16 the long term, the results would be the same under either Alternative 4 or the Proposed Action.

17
18 Compared to the Proposed Action and No Action Alternatives, however, the targeted mitigation
19 analyses required under Alternative 4 would add substantial cost and complexity to RRM
20 activities. RRM agencies would be required to identify, analyze, and implement habitat
21 mitigation work involving historically placed structures outside the road right-of-way. The
22 additional cost and complexity associated with those efforts would likely dissuade many RRM
23 agencies from adopting and implementing the RRM program under Alternative 4.

24
25 In addition, Washington State law strictly limits both the percentage of road project funds and the
26 absolute value of county road funds that county RRM agencies may spend on habitat work
27 outside of the rights-of-way. County RRM agencies make up a large percentage of RRM
28 agencies that intend to implement the Proposed Action. Little or no non-Federal funding may be
29 available to those agencies to perform additional targeted mitigation activities outside of road
30 rights-of-way, as could be required under Alternative 4. Furthermore, county and non-county
31 RRM agencies alike cannot shift existing funds associated with maintenance projects in the right-
32 of-way to underwrite new habitat mitigation actions, whether within or outside the right-of-way.

33
34 Typically, maintenance of the right-of-way structures (e.g., periodic paving, replacement of
35 damaged or aging guardrails, signage updates, etc.) would be a required element of the mitigation
36 package associated with the original construction of each portion of the roadway system. RRM
37 agencies could not utilize funding earmarked for those purposes to underwrite new habitat
38 mitigation activities without violating the permit conditions imposed on them when they first
39 built relevant elements of that system. As a result, to secure additional non-Federal funds for
40 targeted habitat mitigation work outside of the road right-of-way under Alternative 4, it is likely
41 that RRM agencies would have to compete with other habitat protection or restoration groups for
42 grants and other discretionary funds.

1 Few, if any, RRM agencies in Washington have the time, resources, authority, or ability to
2 undertake entrepreneurial fundraising efforts in addition to their existing statutorily mandated
3 RRM responsibilities. It is likely that most RRM agencies would find Alternative 4 burdensome
4 to implement, due to the cost, complexity, and uncertainty of Alternative 4's targeted mitigation
5 process, the limited non-Federal funding available to RRM agencies for targeted habitat work
6 outside the right-of-way, and the costs and uncertainty associated with seeking outside funding
7 for such efforts. As such, it is likely that few, if any, RRM agencies would implement
8 Alternative 4.

Table 2. Comparison of best management practices (BMPs) included under each of the four alternatives.

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Roadway Surface	<p>1. Seven jurisdictions⁷ would implement Clean Water Act National Pollution Discharge Elimination System (NPDES) Phase 1 BMPs⁸ or implement NPDES Construction Site Plans listed below for activities disturbing five or more acres of soil:</p> <ul style="list-style-type: none"> - TESC⁹ plan, and/or - SPCC¹⁰ plan. <p>2. Other jurisdictions use local codes and enforcement.¹¹</p> <ul style="list-style-type: none"> - material/debris disposal - spill prevention and control - scheduling 	<p>1. Same as No Action.</p> <p>In addition, jurisdictions would implement BMPs for the following categories:</p> <ul style="list-style-type: none"> - Roadway - Shoulder work - Filter/perimeter protection - Reduce potential for soil becoming water or air borne - Reduce water velocity/erosive forces - Disturbed areas - Equipment /tools - Material/debris disposal - Painting/markings - Spill prevention and control - Dust Control - Create a berm downslope to control possible runoff. - Asphalt plant maintenance not specifically called out. 	<p>1. Same as No Action.</p> <p>In addition, jurisdictions use the following BMP:</p> <ul style="list-style-type: none"> - Erosion and sediment control in disturbed areas - Material/debris disposal - Spill prevention and control - Scheduling - Evaluation of alternatives to blading - Use safer environmentally sensitive alternative products - Place gravel berms in low spots to prevent liquid palliatives from entering watercourses. - Asphalt plant production 	<p>1. Same as the Proposed Action.</p> <p>In addition, road maintenance agencies would examine use of BMPs for certain practices that require additional time to reduce effects of practices, then investigate and implement mitigation projects to address gaps in resource protection.</p>

⁷ Seven jurisdictions participating in NPDES Phase 1: Pierce, King, Snohomish, and Clark Counties; Seattle, Tacoma, and the Washington Department of Transportation. All other jurisdictions not required to use NPDES Phase I BMPs will follow local code requirements.

⁸ NPDES Phase I BMPs include: erosion and sediment control in disturbed areas, material/debris disposal, spill prevention and control, and use safer environmentally sensitive alternative products.

⁹ Temporary Erosion and Sedimentation Control Plan must be developed if five or more acres of soil are disturbed.

¹⁰ Spill Prevention Control and Countermeasures Plan must be developed if five or more acres of soil are disturbed.

¹¹ If not one of the seven jurisdictions within NPDES Phase I area, or if less than 5 acres of soil is disturbed, then there are no BMP requirements.

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Enclosed Drainage Systems and Cleaning of Enclosed Drainage Systems	<p>1. Seven jurisdictions would implement Clean Water Act NPDES Phase 1 Stormwater Management Plans.</p> <p>2. Jurisdictions would use local codes and enforcement, including: -Material/debris disposal -Spill prevention and control -Scheduling</p>	<p>1. Same as No Action.</p> <p>In addition, jurisdictions would implement BMPs for the following categories as described in the Proposed Action: -Enclosed Drainage Systems -Filter/perimeter protection -Reduce potential for soil becoming water or air borne -Disturbed areas -Equipment /tools -Material/debris disposal -Painting/markings -Spill prevention and control</p>	<p>1. Not applicable.</p> <p>2. Same as No Action.</p>	<p>1. Same as the Proposed Action.</p> <p>In addition, road maintenance agencies would examine use of BMPs for certain practices that require additional time to reduce effects of practices, then investigate and implement mitigation projects to address gaps in resource protection.</p>
Cleaning Enclosed Drainage Systems	<p>1. Seven jurisdictions would implement Clean Water Act NPDES Phase 1 Stormwater Management Plans.</p> <p>2. Other jurisdictions use local codes and enforcement, including: -Material/debris disposal -Spill prevention and control -Scheduling</p>	<p>1. Same as No Action.</p> <p>In addition, jurisdictions would implement BMPs for the following categories as described in the Proposed Action: -Cleaning enclosed drainage systems -Pre-activity -Equipment/tools material -Material/debris disposal -Spill prevention and control -Asphalt plant maintenance not specifically called out.</p>	<p>1. Not applicable.</p> <p>2. Same as No Action.</p>	<p>1. Same as the Proposed Action.</p> <p>In addition, road maintenance agencies would examine use of BMPs for certain practices that require additional time to reduce effects of practices, then investigate and implement mitigation projects to address gaps in resource protection.</p>

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Open Drainage Systems	<p>1. Seven jurisdictions would implement Clean Water Act NPDES Phase I BMPs or implement NPDES Construction Site Plans listed below for activities disturbing five or more acres:</p> <ul style="list-style-type: none"> - TESC plan, and/or - SPCC plan. <p>2. Other jurisdictions would use local codes and enforcement, including:</p> <ul style="list-style-type: none"> -Material/debris disposal -Spill prevention and control -Scheduling -Vegetation 	<p>1. Same as No Action.</p> <p>In addition, jurisdictions in Washington implement BMPs for the following categories as described in the Proposed Action:</p> <ul style="list-style-type: none"> - Open drainage systems - Permits - Scheduling - Filter/perimeter protection - Keep water from water area - Reduce potential for soil becoming water or air borne - Reduce water velocity/erosive forces - Disturbed areas - Equipment/tools - Material/debris disposal - Spill prevention and control - Vegetation <p>2. Same as No Action.</p>	<p>1. Same as No Action.</p> <p>In addition, jurisdiction implements BMPs for the following categories as described in Alternative 3:</p> <ul style="list-style-type: none"> - Permits - Scheduling - Erosion and sediment control - Disturbed areas - Material/debris disposal - Where feasible, reshape existing ditches to improve water quality and vegetation - Triage maintenance <p>2. Same as No Action.</p>	<p>1. Same as the Proposed Action.</p> <p>In addition, road maintenance agencies would examine use of BMPs for certain practices that require additional time to reduce effects of practices, then investigate and implement mitigation projects to address gaps in resource protection.</p> <p>2. Same as No Action.</p>

1
2

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Watercourses and Streams	<p>1. Seven jurisdictions would comply with NPDES Phase 1 BMPs, jurisdictions comply with Washington Dept. of Fish and Wildlife HPA¹² requirements, Aquatic Use Authorization, Shoreline Mgmt. Act and/or Compliance with Critical Areas Standard 10 for local permits.</p> <ul style="list-style-type: none"> -plans and specs. - notification requirement - Fish and wildlife protection or salvage - Protection of water users - In-stream flow requirements - Erosion/sediment control - Equipment/tools - Site restoration - LWM removal or relocation - Material removal - Protection of natural materials - Monitoring - Bank protection 	<p>1. Same as No Action. In addition, jurisdictions in Washington implement BMPs for the following categories as described in the Proposed Action:</p> <ul style="list-style-type: none"> - Watercourses and streams - Permits - Scheduling - Fish exclusion - Filter/Perimeter protection - Keep water from work area - Habitat protection and maintenance - Reduce water velocity/erosive forces - Disturbed areas - Equipment/tools - Material/debris disposal - Spill prevention and control - Riprap limitations (page 2.101 of RRM Program) - Bioengineering (page 2.139 of RRM Program) - Vegetation <p>Specifies consultation with WDFW (through HPA permit process for in water work) to ensure that maintenance work results in fish passage and habitat improvements, where</p>	<p>1. Jurisdiction would meet all applicable Federal, state, and local code and enforcement requirements.</p> <p>In addition, jurisdiction implements BMPs for the following categories as described in Alternative 3:</p> <ul style="list-style-type: none"> - Scheduling - Erosion and sediment control - Disturbed areas - Material/Debris disposal - No new section of riprap covered - Where feasible, reshape existing ditches to improve water quality and vegetation - Bioengineering where appropriate <p>The ODOT Guide relies on in-stream work timing restrictions, rather than a specific fish exclusion protocol.</p>	<p>1. Same as the Proposed Action.</p> <p>In addition, road maintenance agencies would examine use of BMPs for certain practices that require additional time to reduce effects of practices, then investigate and implement mitigation projects to address gaps in resource protection</p>

¹² Washington Department of Fish and Wildlife's hydraulic project approvals required for actions that affect culverts and streamflow.

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Stream Crossings	<p>1. Seven jurisdictions would comply with NPDES BMPs, jurisdictions comply with WDFW HPA requirements, Aquatic Use Authorization, Shoreline Mgmt. Act and/or Compliance with Critical Areas Standards for local permits.</p> <ul style="list-style-type: none"> -plans and specs. - notification requirement - Fish and wildlife protection or salvage - Protection of water users - In-stream flow requirements - Erosion/sediment control - Equipment/tools - Site restoration - LWM removal or relocation - Material removal - Protection of natural materials - Monitoring vegetation - Bank protection - Spill prevention and control 	<p>1. Same as No Action. In addition, jurisdictions in Washington implement BMPs for the following categories as described in the Proposed Action:</p> <ul style="list-style-type: none"> - Permits - Scheduling - Fish exclusion - Filter/perimeter protection - Keep water from work area - Habitat protection/maintenance - Reduce water velocity/erosive forces - Disturbed Areas - Equipment/tools - Material/Debris disposal - Spill prevention and control - Fish passage design at road culverts <p>Specifies consultation with WDFW (through the HPA permit process for in-water work) to ensure that maintenance work results in fish passage improvements, where possible.</p> <p>Refers chronic maintenance problems to agency watershed planning and/or Capital Improvement Programs.</p>	<p>1. Jurisdiction would meet all applicable Federal, state, and local code and enforcement requirements.</p> <p>In addition, jurisdiction implements BMPs for the following categories as described in Alternative 3:</p> <ul style="list-style-type: none"> - Permits - Scheduling - Erosion/sediment control - Material/debris disposal - Criteria for stream-road crossings - Tidegate maintenance <p>The Fish Exclusion Protocol in the RRM Program has no counterpart in the ODOT Guide, which relies on in-stream work timing restrictions.</p> <p>2. Same as No Action.</p>	<p>1. Same as the Proposed Action.</p> <p>In addition, road maintenance agencies would examine use of BMPs for certain practices that require additional time to reduce effects of practices, then investigate and implement mitigation projects to address gaps in resource protection.</p>

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Gravel Shoulders	<p>1. Seven jurisdictions would implement Clean Water Act NPDES Phase I BMPs or implement NPDES Construction Site Plans listed below for activities disturbing five or more acres:</p> <ul style="list-style-type: none"> - TESC plan, and/or - SPCC plan. <p>2. Other jurisdictions would use local codes and enforcement.</p> <ul style="list-style-type: none"> - material/debris disposal - spill prevention and control - scheduling 	<p>1. Same as No Action.</p> <p>In addition, jurisdictions in Washington implement BMPs for the following categories as described in the Proposed Action:</p> <ul style="list-style-type: none"> - Gravel shoulders - Scheduling - Filter/perimeter protection - Disturbed areas - Equipment/tools - Material/debris disposal - Spill prevention and control 	<p>1. Same as No Action.</p> <p>In addition, jurisdiction implements BMPs for the following categories as described in Alternative 3:</p> <ul style="list-style-type: none"> - Scheduling - Erosion and sediment control - Disturbed areas - Evaluation of alternatives to blading 	<p>1. Same as Proposed Action.</p> <p>In addition, road maintenance agencies would examine use of BMPs for certain practices that require additional time to reduce effects of practices, then investigate and implement mitigation projects to address gaps in resource protection</p>

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Street Surface Cleaning	<p>1. Seven jurisdictions would implement Clean Water Act NPDES Phase I stormwater management plans.</p> <p>2. Other jurisdictions would use local codes and enforcement, including: -Material/debris disposal -Spill prevention and control -Scheduling</p>	<p>1. Same as No Action.</p> <p>In addition, jurisdictions would implement BMPs for the following categories as described in the Proposed Action: - Pre-activity - Equipment/tools - Material / debris disposal - Spill prevention and control - Use pickup brooms in sensitive areas - Always use water with mechanical brooms - Sweepers (page 2.150 RRM Program)</p> <p>Cleaning bridge scuppers is not specifically called out, it is an activity covered under Maintenance Category #3 Cleaning Enclosed Drainage Systems.</p>	<p>1. Same as No Action.</p> <p>In addition, jurisdiction would implement BMPs for the following categories as described in Alternative 3: - Scheduling - Material/debris disposal - Bridge scupper cleaning - Remove sweepings produced within 25 feet of identified sensitive spawning areas, if the design of facility allows. - Use water as needed or sweep during damp weather - When practical, place sediment barriers to route material away from watercourse.</p>	<p>1. Same as Proposed Action.</p>

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
<p>1 2</p> <p>Bridge Maintenance</p>	<p>1. Seven jurisdictions would comply with NPDES BMPs; jurisdictions comply with WDFW HPA requirements, Aquatic Use Authorization, Shoreline Mgmt. Act and/or Compliance with Critical Areas Standards for local permits.</p> <ul style="list-style-type: none"> - plans and specs. - notification requirement - Fish and wildlife protection or salvage - Protection of water users - In-stream flow requirements - Erosion/sediment control - Equipment/tools - Site restoration - LWM removal or relocation - Material removal - Protection of natural materials - Monitoring vegetation - Spill prevention and control 	<p>1. Same as No Action.</p> <p>In addition, jurisdictions in Washington implement BMPs for the following categories as described in the Proposed Action:</p> <ul style="list-style-type: none"> - Permits - Scheduling - Fish exclusion - Filter/perimeter protection - Keep water from work area - Habitat protection/maintenance - Reduce water velocity/erosive forces - Disturbed Areas - Equipment/tools - Material/Debris disposal - Spill prevention and control - Bioengineering (page 2.139 of RRM Program) <p>Specifies consultation with WDFW (through the HPA permit process for in-water work) to ensure that maintenance work results in fish passage improvements, where possible.</p> <p>Concrete is covered in Maintenance Category # 12 - Concrete.</p>	<p>1. Jurisdiction would meet all applicable state, and local code and enforcement requirements.</p> <p>In addition, jurisdiction implements BMPs for the following categories as described in Alternative 3:</p> <ul style="list-style-type: none"> - Permits - Scheduling - Drift removal - Bridge cleaning/maintenance - Reduce potential for contaminants falling into water - Disturbed areas - Material debris disposal - Concrete - Bioengineering solutions where appropriate - Avoid creosote or penta treated wood for permanent structures. - Develop policy to eliminate drainage systems that drain directly to streams where physically possible. - Specifies consultation with <p>ODFW to ensure that maintenance work results in fish passage improvements and enhancements where possible.</p>	<p>1. Same as Proposed Action.</p> <p>In addition, road maintenance agencies would examine use of BMPs for certain practices that require additional time to reduce effects of practices, then investigate and implement mitigation projects to address gaps in resource protection</p>

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Snow and Ice Control	<p>1. Jurisdictions would use local codes and enforcement, including:</p> <ul style="list-style-type: none"> -Material/debris disposal -Spill prevention and control -Scheduling 	<p>1. Same as No Action.</p> <p>In addition, jurisdictions in Washington implement BMPs for the following categories as described in the Proposed Action:</p> <ul style="list-style-type: none"> - Operational (reduce sand to salt ratio; reduce plowing speed; remove sand from road surface) - Equipment/tools - Material/debris disposal - Spill prevention and control <p>Training is covered in Program Element 3.</p>	<p>1. Same as No Action.</p> <p>In addition, jurisdiction implements BMPs for the following categories as described in Alternative 3:</p> <ul style="list-style-type: none"> - Reduce application rates of sand - Use CMA on bridges and roads where permitted in lieu of sanding - Place barriers in site specific locations - Reduce plowing speed - Stop sidecasting within 50 feet of structures over water - Clean inlets prior to first rain - modify blade angles or blower hoppers - Educate staff 	<p>1. Same as Proposed Action.</p>

1
2

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State: (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Emergency Slide/Washout Repair	<p>1. Jurisdictions would use local codes and enforcement, including:</p> <ul style="list-style-type: none"> -Material/debris disposal -Spill prevention and control -Scheduling <p>Very few emergency slide/washout repairs are in watercourses or streams. Those that are follow the watercourse and stream category. See above.</p>	<p>1. Same as No Action.</p> <p>In addition, jurisdictions in Washington implement BMPs for the following categories as described in the Proposed Action:</p> <ul style="list-style-type: none"> - Permits - Fish exclusion - Filter/perimeter protection - Reduce water velocity/erosive forces - Keep water from work area - Disturbed areas - Material/debris disposal - Equipment/tools - Spill prevention and control - Notification - Bioengineering (page 2.139 of RRM Program) - Riprap limitations (page 2.101 of RRM Program) <p>Emergency responses in watercourses and streams are limited to stabilizing the area.</p>	<p>1. Jurisdiction would meet all applicable state, and local code and enforcement requirements.</p> <p>In addition, jurisdiction implements BMPs for the following categories as described in Alternative 3:</p> <ul style="list-style-type: none"> - Permits - Scheduling - Erosion and sediment control - Disturbed areas - Material/debris disposal - Notification - Bioengineering where appropriate - No new sections of riprap covered. 	<p>1. Same as the Proposed.</p> <p>In addition, road maintenance agencies would examine use of BMPs for certain practices that require additional time to reduce effects of practices, then investigate and implement mitigation projects to address gaps in resource protection</p>

1
2
3

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Maintenance of Concrete Surfaces	<p>1. Jurisdictions would use local codes and enforcement, including:</p> <ul style="list-style-type: none"> -Material/debris disposal -Spill prevention and control -Scheduling 	<p>1. Same as No Action.</p> <p>In addition, jurisdictions in Washington implement BMPs for the following categories as described in the Proposed Action:</p> <ul style="list-style-type: none"> - Filter/perimeter protection - Containment - Disturbed areas - Material/debris disposal - Equipment/tools - Spill prevention and control 	<p>1. Same as No Action.</p> <p>In addition, jurisdiction implements BMPs for the following categories as described in Alternative 3:</p> <ul style="list-style-type: none"> - Coordinate with ODFW - Ensure streams do not come into contact with fresh, plastic concrete - Provide concrete truck chute clean-out area 	<p>1. Same as Proposed Action.</p>
Maintenance of Sewer Systems	<p>1. Jurisdictions would use local codes and enforcement, including:</p> <ul style="list-style-type: none"> -Material/debris disposal -Spill prevention and control -Scheduling 	<p>1. Same as No Action.</p> <p>In addition, jurisdictions in Washington implement BMPs for the following categories as described in the Proposed Action:</p> <ul style="list-style-type: none"> - Sewer system - Filter/perimeter protection - Keep water from work area - Reduce potential for soil becoming water or air borne - Disturbed areas - Equipment/tools - Material/debris disposal - Spill prevention and control 	<p>1. Not applicable.</p> <p>2. Same as No Action.</p>	<p>1. Same as Proposed Action.</p>

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Maintenance of Water Systems	<p>1. Jurisdictions would use local codes and enforcement, including:</p> <ul style="list-style-type: none"> -Material/debris disposal -Spill prevention and control -Scheduling 	<p>1. Same as No Action.</p> <p>In addition, jurisdictions would implement BMPs for the following categories as described in the Proposed Action:</p> <ul style="list-style-type: none"> - Water system - Operational - Filter/perimeter protection - Keep water from work area - Reduce potential for soil becoming water or air borne - Disturbed areas - Equipment/tools - Material/debris disposal - Spill prevention and control 	<p>1. Not applicable.</p> <p>2. Same as No Action.</p>	<p>1. Same as Proposed Action.</p>

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Vegetation	<p>1. Use herbicides as directed by the EPA product label.</p> <p>Jurisdictions would use local codes and enforcement, including:</p> <ul style="list-style-type: none"> -Material/debris disposal -Spill prevention and control -Scheduling -Mowing -Brush cutting -Hand cutting -Seeding -Chipping -Chemical application 	<p>1. Same as No Action.</p> <p>In addition, jurisdictions in Washington implement BMPs for the following categories as described in the Proposed Action:</p> <ul style="list-style-type: none"> - Right-of-way - Shoulder work - Filter/perimeter protection - Reduce potential for soil becoming water or air borne - Reduce water velocity/erosive forces - Disturbed areas - Mowing - Brush cutting - Hand cutting - Seeding - Chipping - Chemical application - Equipment/tools - Material/ debris disposal - Spill prevention and control - Each RRM Program maintenance category contains associated vegetation management practices. - Roadside vegetation management zones. <p>Note: Although the use of herbicides and pesticides is not included under Limit 10, BMPs for</p>	<p>1. Same as No Action.</p> <p>In addition, jurisdiction implements BMPs for the following categories as described in Alternative 3:</p> <ul style="list-style-type: none"> - Disturbed areas - Mowing - Brush cutting - Spraying - Debris disposal - Bridge vegetation - Other vegetation management - Culvert vegetation - Buffer strips - Coordination with ODFW for danger tree removal within 50 feet of streams. 	<p>1. Same as Proposed Action.</p> <p>In addition, road maintenance agencies would examine use of BMPs for certain practices that require additional time to reduce effects of practices; then investigate and implement mitigation projects to address gaps in resource protection</p>

Activity	Alternative 1 (No Action)	Alternative 2: Approve RRM Program from Jurisdictions in Washington State (Proposed Action)	Alternative 3: Approve a Program Comparable to Oregon Department of Transportation's RRM Program	Alternative 4: Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures
Other	<p>1. Local incident response procedures.</p> <p>2. Jurisdictions would use local codes and enforcement, including: -Material/debris disposal -Spill prevention and control -Scheduling</p>	<p>1. Same as the No Action.</p> <p>In addition, jurisdictions would implement BMPs for the following categories as described in the Proposed Action: - Accident clean up is addressed in Program Element 7: Emergency Response. - Stockpiling is not specifically called out in the RRM Program. However, it is contained in material/debris disposal.</p>	<p>1. Same as No Action.</p> <p>In addition, jurisdiction would implement BMPs for the following categories as described in Alternative 3: - Accident clean up - Stockpiling</p>	<p>1. Same as No Action.</p> <p>In addition, road maintenance agencies would examine use of BMPs for certain practices that require additional time to reduce effects of practices, then investigate and implement mitigation projects to address gaps in resource protection</p>

3.0 AFFECTED ENVIRONMENT

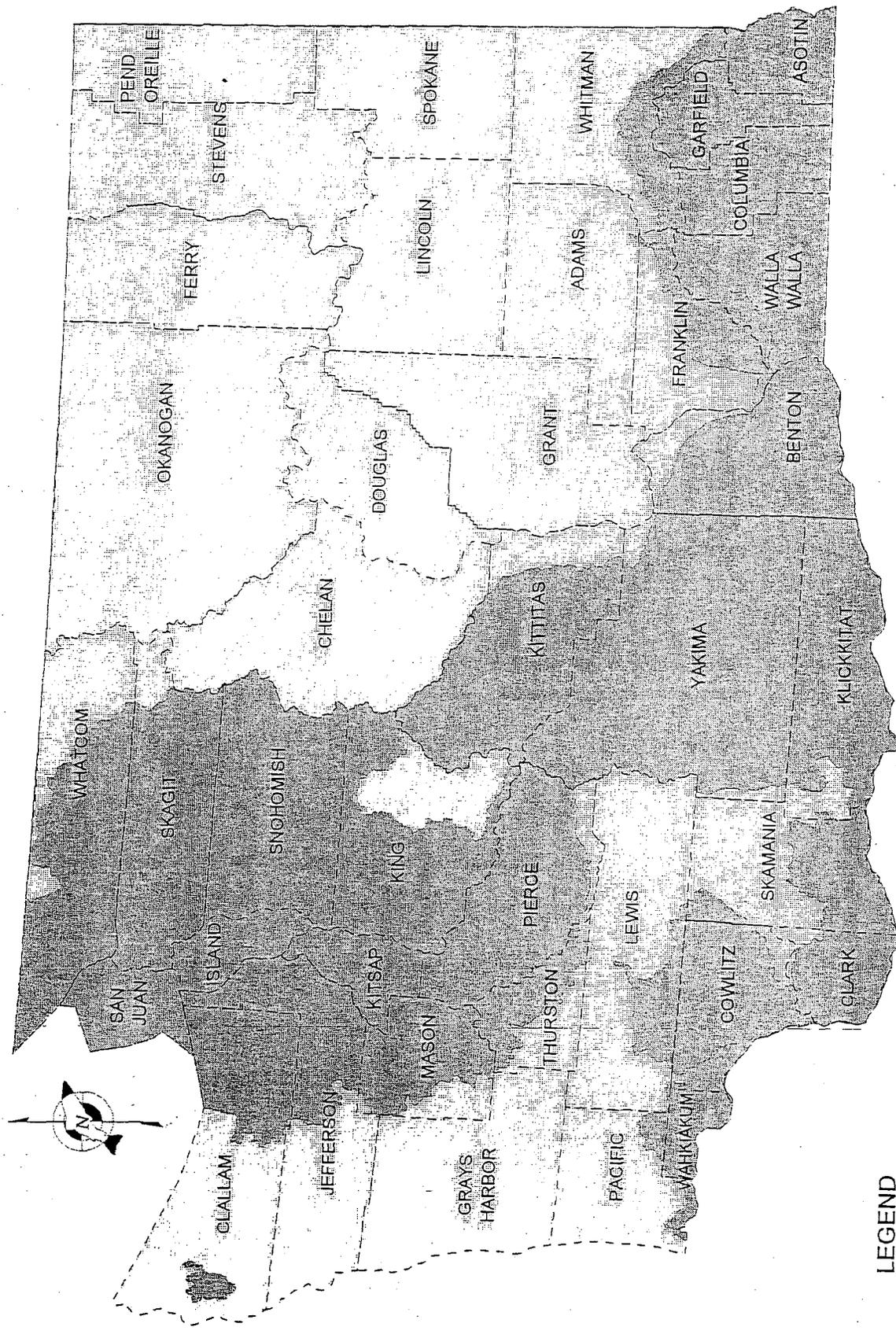
3.1 Introduction

This section describes current conditions of the resources that may be affected by implementing the Proposed Action or its alternatives. The affected environment is defined as that portion of the physical, biological, and social environment that may be affected by implementation of the alternatives. The proposed action addresses 10 threatened salmonid ESUs. Any effects of the proposed action would occur within the ESU ranges, although some secondary effects may occur outside of these ranges. The analysis area consists of an area of 27,430 square miles in the state of Washington, including upland, freshwater, estuarine, and near-shore marine areas (Figure 1). The near-shore marine area extends 3 miles west of the coastline from the Puget Sound to the mouth of the Columbia River in Washington.

This EA is the sequential, second stage, NEPA analysis based on the ESA Section 4(d) Limit 10 Programmatic EA that analyzed environmental impacts associated with implementation of Limit 10 (subsection 1.3.2, Environmental Review, Limit 10 Programmatic EA Findings). The actual geographic scope of each potential 4(d) rule Limit 10 RRM program submitted to NOAA Fisheries was unknown during the preparation of the Programmatic EA for Limit 10. Therefore, the Programmatic EA encompassed the July 2000 4(d) rule's 14 threatened ESUs to describe the environment to be affected by implementation of Limit 10 as a NOAA Fisheries policy. The description of the environment in the Limit 10 Programmatic EA was of a general nature because of the widely diverse area encountered across the major portion of four states where jurisdictions are located that might submit Limit 10 RRM programs to NOAA Fisheries for review. The following is a more specific description of the environment as it applies to the 4(d) rule Limit 10 submittal from jurisdictions in the state of Washington, tiering off the Limit 10 Programmatic EA. The geographic extent of this EA's analysis area is shown in Figure 2 in relation to the analysis area of the Limit 10 Programmatic EA. This chapter will incorporate information by reference from the Affected Environment chapter of the Limit 10 Programmatic EA.

Fifteen resource categories were described in the Limit 10 Programmatic EA (NOAA Fisheries 2002). It was found that the Programmatic EA's Proposed Action (i.e., take prohibitions with Limit 10) had no direct or indirect negative impact on the following resources: land use, geology and physiography, climate, demographic trends, economy, tourism and recreation, and cultural resources. Because this sequential EA is tiering off the Proposed Action in the Limit 10 Programmatic EA, it is assumed that the alternatives in the sequential EA would also have no direct or indirect negative impact on these resources and therefore they are not analyzed in this EA.

The Proposed Action in the Limit 10 Programmatic EA had either a beneficial or some short term direct or indirect negative impact on the following eight resources and other topics, which are described in this section:



LEGEND

--- County Boundaries



Geographic Extent of ESUs in July 2000 4(d) Rule in WA

Figure 1. Analysis Area for NEPA Limit 10 Sequential EA

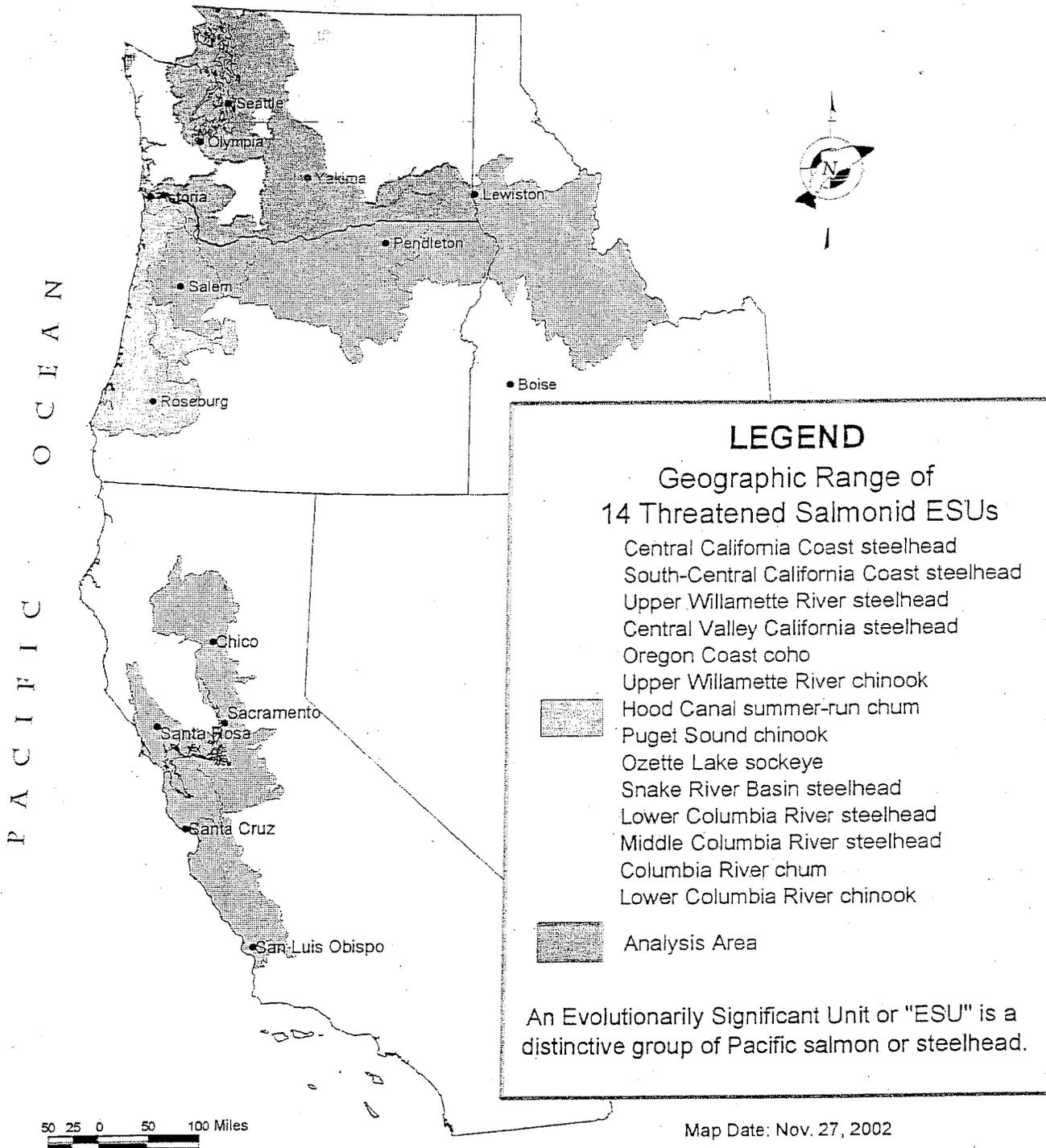


Figure 2. Analysis Area and Geographic Extent of ESUs in July 2000 4(d) Rule

- 1
- 2 1. Soils (subsection 3.2)
- 3 2. Air Quality (subsection 3.3)
- 4 3. Water Quantity (subsection 3.4)
- 5 4. Water Quality (subsection 3.5)
- 6 5. Fish and Aquatic Habitat (subsection 3.6)
- 7 6. Wildlife (subsection 3.7)
- 8 7. Vegetation (subsection 3.8)
- 9 8. Tribal Treaty and Trust Responsibilities; Tribal Rights and Interests (subsection 3.9)
- 10 9. Environmental Justice (subsection 3.10)
- 11

12 The analysis area spans three major physiographic provinces. It extends from southeastern
13 Washington and crosses the Columbia Plateau, Cascade Mountains, and the Pacific Border
14 provinces spanning Washington. The analysis area consists of the Columbia River basin in the
15 State of Washington downstream of Priest Rapids Dam and watersheds that drain to Puget
16 Sound.

17
18 The analysis area consists of a varied landscape with heavily populated areas as well as many
19 relatively undeveloped areas of scenic value. Forests and mountains in Washington generally
20 have abundant and diverse aquatic, terrestrial, and wildlife resources. Water-related settings
21 range from urban development and waterfront parks to wilderness mountain lakes and streams.
22 A variety of Federal, state, and private land ownership patterns; different land productivity; and
23 varying abundance of water influence land use in the analysis area. Large areas of publicly
24 owned land provide a notable proportion of the natural and recreational resources found in the
25 analysis area.

26
27 Washington's statewide estimated population at the end of 2000 was 5,894,121 making it the 15th
28 most populous state in the country (U.S. Census Bureau 2001). Population growth in the
29 analysis area has occurred primarily in major metropolitan areas, such as Seattle, Tacoma, and
30 Vancouver (Table 3) (U.S. Census Bureau 2001). The remaining areas are relatively sparsely
31 populated because large tracts of land are devoted to agriculture, forestry, and livestock grazing.

Table 3. Population for Washington, the analysis area, and selected major cities in the analysis area in 2000.

STATE/ANALYSIS AREA/CITY	POPULATION
Washington	5,894,121
Analysis Area	3,517,084
Seattle	563,374
Tacoma	193,556
Vancouver	143,560
Yakima	71,845

Source: U.S. Census Bureau 2001.

Part or all of 28 counties fall within the analysis area (Figure 1), out of a total of 39 counties in Washington. Approximately 3,517,084 million people reside within the analysis area, which represents about 60 percent of the total population of Washington and approximately 69 percent of the total population in the 28 counties fully or partially within the analysis area (U.S. Census Bureau 2001). This population estimate for the analysis area was calculated by taking the ratio of total square miles in the 28 counties to the square miles reported to fall within the analysis area and applying that ratio to the total population in the 28 counties as reported by the U.S. Census Bureau (2001).

Population is not distributed evenly across the analysis area. Population density range from 817 people per square mile in urban areas, to 3 persons per square mile in rural areas (Table 4). Most of the population is located in the Puget Sound region (Snohomish, King, Pierce, and Thurston Counties), with smaller centers around Vancouver (Clark County), and Yakima (Yakima County). Metropolitan areas with the highest population densities are located along coastal areas and waterways such as Puget Sound and the Columbia River. Economic restructuring, resulting in a focus on advanced services, financial, insurance and real estate, high tech industry, has resulted in a resurgence in urban growth in the large metropolitan areas, as well as communities previously dependent on resource and extractive economies (Frey and Fielding 1995).

Table 4. Population of five counties in the analysis area.

COUNTY	POPULATION	% CHANGE 1990 - 2000	PERSON/SQUARE MILE
King County	1,737,034	15.2	817.0
Clark County	345,238	45.0	549.7
Whatcom	166,814	30.5	78.7
Wahkiakum	3,824	14.9	14.5
Garfield	2,397	6.6	3.4

Source: U.S. Census Bureau 2001.

Population growth rates for Washington and the analysis area have fluctuated to a moderate degree over time, but always with an increasing trend (U.S. Census Bureau 2001). The state's population change between 1990 to 2000 was 21.1 percent, with an increase of 1.6 percent between 1990 and 2000. Similarly, all counties in the analysis area also experienced positive populations growth rates (Table 4). Statewide population in 1950 was 2.4 million, with a population of 5.8 million in 2000. Washington's population is anticipated to grow to approximately 6.7 million by 2010 and 7.6 million by 2020 (Washington State Office of Financial Management 2001).

3.2 Soils

Geology and geologic processes, topography, climate, plants, animals, and organisms all interact over time to form soils. The soil forming processes described in subsection 4.4, Soils, in the Affected Environment chapter of the Programmatic EA for Limit 10 also apply to the analysis area and are incorporated here by reference (NOAA Fisheries 2002). Most soils in the analysis area are young and thin. Critical soil processes such as nutrient cycling, infiltration, and percolation occur only in the upper few inches or feet of the soil column. Soil-forming and recovery processes are slow; therefore, disturbance can cause long-term changes in the local ecology, including biological and hydrologic processes (Interior Columbia Basin Ecosystem Management Project 2000).

Most soils in the analysis area have formed since the time of the last ice age, and are composed of several horizons, or layers. At the surface, there is commonly a thin (generally less than 2 inches), and sometimes discontinuous cover of decaying organic matter. Under this cover of litter and duff is a layer (at most a few inches thick) of dark, highly decomposed organic matter (humus), which covers a mineral layer that may be several feet thick. This mineral layer may

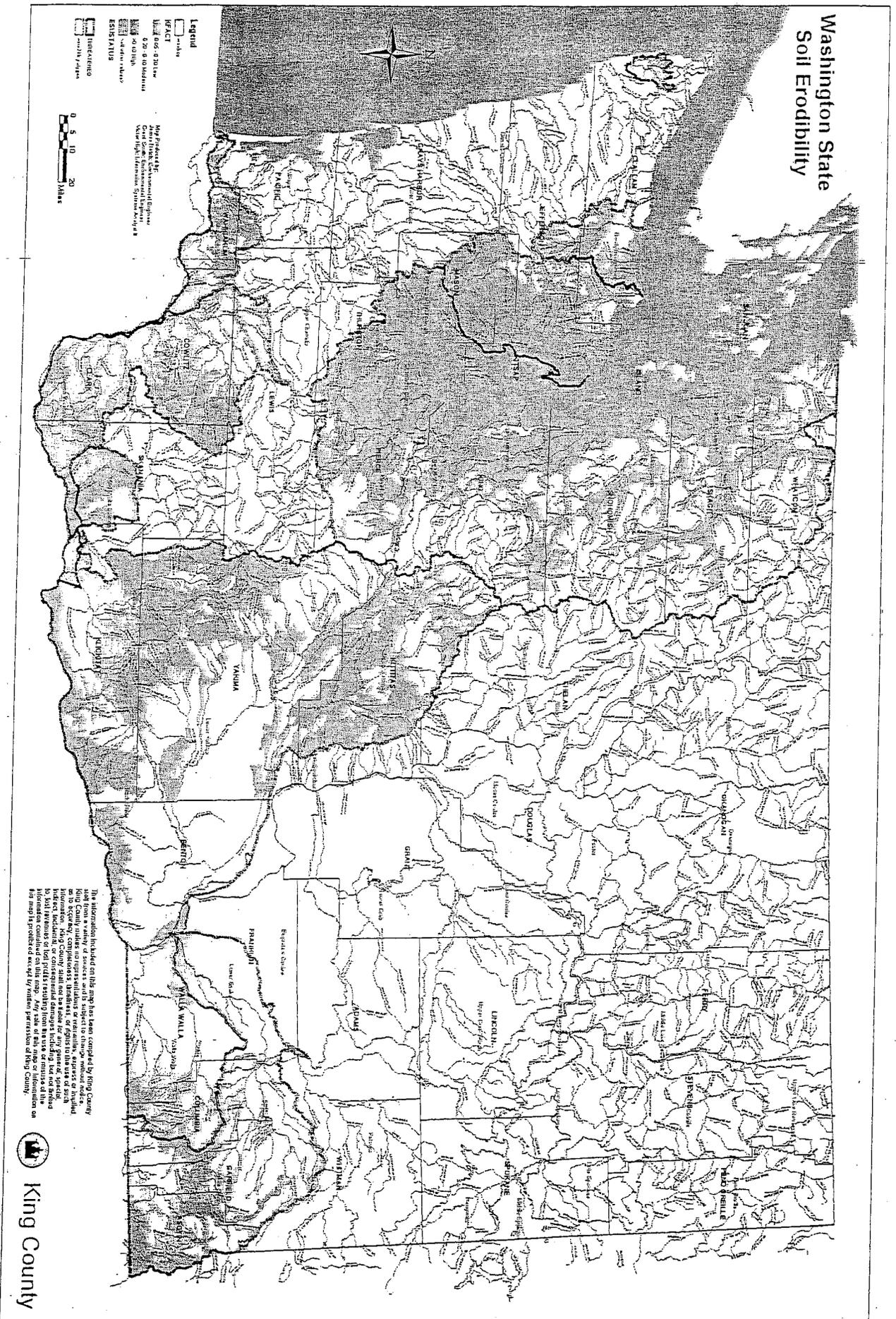
1 contain organic matter, clay minerals, calcium carbonate, and other salts that are transported
2 down the soil column by percolation or burrowing activities. In general, forested environments
3 have more continuous and thicker layers of organic matter than do rangeland environments, but
4 the thickness and amount of organic material varies considerably depending on local vegetation
5 characteristics, climate, relief, and disturbance history. These soil horizons together cover
6 weathered and unweathered parent materials such as bedrock or old stream gravel. Volcanic
7 material is a major component of many soils in the analysis area (Harvey et al. 1994; Henjum et
8 al. 1994; Quigley and Arbelbide 1997).

9
10 The susceptibility to soil disturbance within the analysis area is a predictor of the magnitude of
11 sedimentation that may occur in adjacent water bodies. High susceptibility to soil disturbance is
12 found throughout the analysis area, particularly associated with steep slopes and in the eastern
13 portion of the analysis area (Figure 3). Sediment transported from upland areas into stream
14 channels affects the quality of salmonid habitat found in streams, rivers, and estuaries (subsection
15 4.8.4., Sediment and Turbidity). Susceptibility to soil disturbance is not the sole factor
16 determining potential streamload, however. Local watershed climate, topography, geology,
17 vegetation, and hydrology control sediment delivery rate and composition (Quigley and
18 Arbelbide 1997; National Research Council 1996). Variation in these watershed characteristics
19 is ultimately determined by the type and quality of habitat found in a given system.

20
21 The physical properties of soils can be substantially altered by disturbances such as erosion and
22 compaction (Interior Columbia Basin Ecosystem Management Project 2000). Soil compaction
23 results from concentrated activity, including use of heavy equipment, vehicles, pedestrian
24 activity, and improper livestock grazing. Where soils are compacted, porosity, permeability, and
25 hydrologic conductivity are reduced, resulting in altered runoff patterns and increased surface
26 erosion. Natural recovery from surface compaction can take 50 to 200 years, depending on the
27 soil type, degree of compaction, frequency of freeze-thaw cycles, and input of organic matter
28 (Interior Columbia Basin Ecosystem Management Project 2000). Land use practices, through
29 alteration of soil structure, vegetation, and hydrology, can substantially alter the delivery of fine
30 and coarse sediments to streams, thereby affecting salmonid habitats (Swanston 1991; Beschta et
31 al. 1995; Interior Columbia Basin Ecosystem Management Project 2000).

32
33 Overall, soil conditions in the analysis area are stable to declining, depending on past levels of
34 management activity (Interior Columbia Basin Ecosystem Management Project 2000; National
35 Marine Fisheries Service 2002). There has been a loss of soil material from direct displacement
36 of soils, as well as from surface and mass erosion. In rangeland soils, the function and
37 development of microbiotic crusts have been reduced in areas where surface-disturbing activities
38 have been high. These crusts provide soil stability and retention, and are essential for nutrient
39 availability and cycling. Floodplain and riparian area soils have a reduced ability to store and
40 regulate chemicals and water in areas where riparian vegetation has been reduced or removed, or
41 where soil loss associated with roads in riparian areas has occurred. In these areas, water
42 quantity may be reduced during low flows, and water quantity may have less buffer from
pollution (Interior Columbia Basin Ecosystem Management Project 2000).

Figure 3. Washington State Soil Erodibility in the Analysis Area



3.3 Air Quality

The Federal Clean Air Act, including the amendments of 1977, 1980, and 1990 (40 CFR 50), is designed to preserve air resources. The Clean Air Act requires states to develop strategies for achieving and maintaining compliance with ambient air quality standards. Individual states must monitor and report compliance with the standards. They must also develop programs designed to achieve and maintain compliance with the standards. These programs are outlined in the State Implementation Plans. The state of Washington has a U.S. Environmental Protection Agency-approved State Implementation Plan that regulate, among other pollutants, emissions from prescribed burning. Washington's State Implementation Plan also addresses particulate matter (including "PM10"), visibility, and smoke management. The factors affecting air quality are described in subsection 4.6, Air Quality, in the Affected Environment chapter of the Programmatic EA for Limit 10 (2002). These factors, and resulting trends in air pollution, also apply to the analysis area and are incorporated here by reference.

Nonattainment areas are locations that are not currently able to meet air quality standards. Several metropolitan areas and other locations within the analysis area are designated as non-attainment for various pollutants (Table 5)(U. S. Environmental Protection Agency 2002). Sources with the potential to emit non-attainment pollutants, such as industrial plants and motor vehicles, are often subject to more stringent regulations. The U. S. Environmental Protection Agency has designated 13 areas in the state of Washington as nonattainment for ozone, particulate matter, and carbon monoxide (Washington Department of Ecology 2002).

Washington's Department of Ecology identifies the major sources of particulate matter as wood stoves, industry, dust construction, street sand application, and open burning (Washington Department of Ecology 2000). The pollutant of greatest concern for RRM activities in the analysis area is particulate matter (PM10). Several locations in the analysis area are not in attainment for PM₁₀ (particulate matter with a diameter of less than 10 micrometers) (Figure 4; Table 5). For PM₁₀ nonattainment areas, the state of Washington requires the use of every reasonable precaution to minimize deposition of particulate matter to paved road surfaces. Reasonable precautions generally include, removal of particulate matter from equipment prior to movement on paved streets and the prompt removal of any particulate matter deposited on paved streets (Washington Department of Ecology 2000).

Table 5. Current air quality status in the analysis area for particulate matter.

POLLUTANT	AREA OR COUNTY IN THE ANALYSIS AREA
Particulate Matter (PM10)	Maintenance areas¹³ <ul style="list-style-type: none"> • Thurston County • Tacoma Tideflats • Kent Valley • Seattle Duwamish • Yakima
	Nonattainment Areas <ul style="list-style-type: none"> • Yakima • Wallula

Source: Washington Department of Ecology 2002.

RRM activities are not a major source of pollutants, particularly in urban areas. The primary pollutant of concern for typical road maintenance activities is PM₁₀ (U. S. Environmental Protection Agency 1995a). Washington's Department of Ecology identifies the major sources of particulate matter as wood stoves, industry, dust construction, street sand application, and open burning (Washington Department of Ecology 2000). The primary source of PM₁₀ emissions during paved or unpaved road maintenance activities is the mechanical disturbance of material due to passing vehicles and bulk material handling activities such as grading, loading, transport, and dumping (U. S. Environmental Protection Agency 1995b). Unpaved roads, and to a lesser extent paved roads, can be a source of PM₁₀ when winds carry dust from the road surface into the atmosphere (U. S. Environmental Protection Agency 1995b).

3.4 Water Quantity

The flow in streams and rivers is a function of the climate, topography, geology, geomorphology, soils, and vegetative characteristics of a watershed. NOAA Fisheries' Programmatic EA for Limit 10 describes different hydrologic patterns and processes across four states, and identifies factors that affect these processes, and how changes in these processes can impact salmonids (Limit 10 Programmatic EA, subsection 4.4, Water Quantity). Many of the same hydrologic patterns, and factors that alter these patterns, are also found in the analysis area for this EA.

¹³ Nonattainment areas can be redesignated as attainment if the area both meets air quality standards and has a 10-year plan for continuing to meet the standard. Areas that are redesignated to attainment are called maintenance areas.

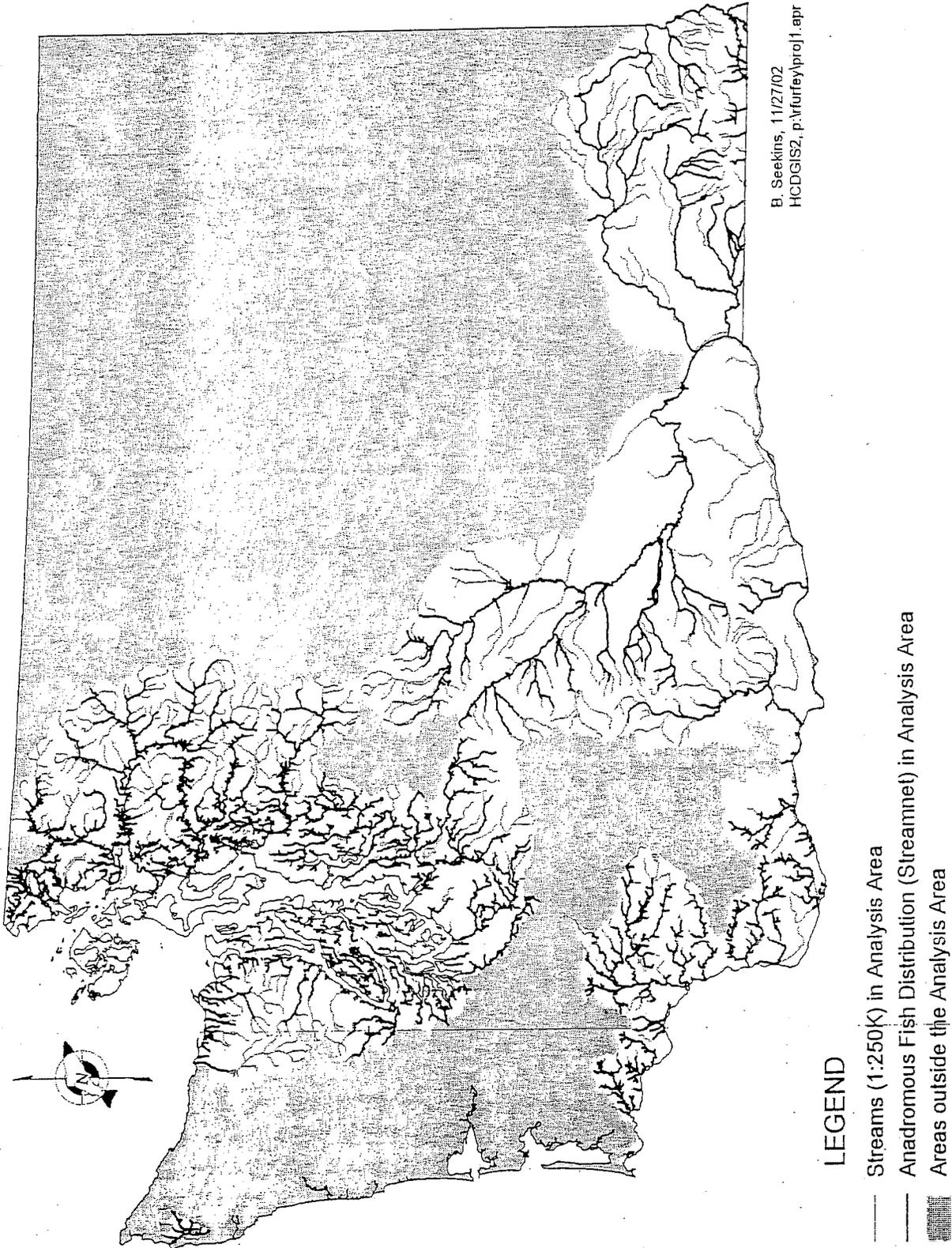


Figure 5. Rivers, Streams, and Accessibility to Anadromous Salmonids.



LEGEND

-  Outline of 4(d) ESU Analysis Area
-  WRIAs (or portions of WRIAs) that fall outside the Analysis Area
-  WRIAs (or portions of WRIAs) inside the 4 (d) ESU Analysis Area

Figure 6. State Designated Water Resource Inventory Areas in the Analysis Area.

1 In the Coast Range, western Cascades, and Puget Sound lowlands, frequent and heavy
2 precipitation from November to March leads to a highly variable stream flow regime with peaks
3 that closely correspond in time to peak precipitation (Swanston 1991). In general, precipitation
4 events of similar intensity would result in higher peak flows in the winter, when soils are more
5 fully saturated and vegetative transpiration demands are low, than in the fall (National Research
6 Council 1996). Streamflows are lowest during the summer when precipitation is low, vegetation
7 demands are high, and soil moisture is depleted (National Research Council 1996).

8
9 In mid-elevations of the Cascades, soils become saturated as rainfall increases in the fall. During
10 the winter, combinations of rain and snow events occur. During rainfall events, water tends to
11 runoff quickly to the stream channel because soil moisture is high and vegetation demand is low.
12 Precipitation that falls as snow is stored above ground for varying lengths of time, but it generally
13 melts within a few weeks of falling (Swanston 1991). Thus, increases in streamflow from
14 melting snow would occur days, or even weeks after the peak snowfall. Some of the more
15 notable high-flow events occur when high-intensity rains follow substantial snowfall.

16
17 In the high Cascades, moisture from precipitation is stored in snowpack through much of the
18 winter and released when temperatures warm in the late spring. Stream flow is characterized by
19 low winter flow followed by rapid flow increases during the spring snowmelt period. As
20 snowpack diminishes, streamflow recedes, and late summer flows are typically low, although
21 minor peaks may result from intense convection storms. In the fall, rainstorms of moderate
22 intensity can cause additional peaks in flow (Swanston 1991).

23
24 Below-average precipitation and runoff can have impacts on streams and watersheds. This
25 influence, however, is not well documented. It is likely that droughts affect the input of
26 nutrients, external stream material, and large woody debris to stream channels. Within the
27 stream channel, low flows can constrict the available habitat and allow water temperatures to
28 warm, which stresses fish or creates thermal barriers that block migration (Spence et al. 1996).

29
30 Washington has approximately 73,886 miles of rivers and streams and 4,174 lakes (Washington
31 Department of Natural Resources 1998). The analysis area includes a large number of these
32 rivers and streams (Figure 5). Most of the streams in the southern portion of the analysis area
33 ultimately drain to the Columbia River, while many lowland river and streams in the western
34 portion of the analysis drain into Puget Sound. The Washington Department of Ecology and
35 other state resource agencies use a system of "Watershed Resource Inventory Areas" to refer to
36 the state's major watershed basins. The analysis area encompasses 31 of the state's 62 designated
37 Water Resource Inventory Areas (Figure 6).

38
39 Competing demands for surface and groundwater have resulted reduced seasonal flows in many
40 rivers in the analysis area. Sixteen of the state's 62 Water Resource Inventory Areas are
41 classified as over-appropriated basins where stream flows are critical to salmonid recovery.
42 Thirteen of the over-appropriated basins are in the analysis area (Washington's Statewide

1 Strategy to Recover Salmon 1999)(Table 6).
 2

3 **Table 6.** Over-appropriated basins in the analysis area where flow is critical to salmonid
 4 recovery.
 5

BASIN	WATER RESOURCE INVENTORY AREA NUMBER
Nooksack	WRIA 1
Snohomish	WRIA 7
Cedar-Sammamish	WRIA 8
Duwamish-Green	WRIA 9
Puyallup-White	WRIA 10
Chambers-Clover	WRIA 12
Quilcene	WRIA 17
Elwha-Dungeness	WRIA 18
Walla Walla	WRIA 32
Middle Snake	WRIA 35
Lower Yakima	WRIA 37
Naches	WRIA 38
Upper Yakima	WRIA 39

19
 20
 21 Source: Washington Statewide Strategy to Recover Salmon 1999.

22
 23 Flow regimes throughout the analysis area have been extensively altered by dams, surface and
 24 groundwater diversions, channelization, development, and diking along rivers, and loss of
 25 vegetative cover and riparian vegetation. Stream, riparian, and other aquatic systems throughout
 26 the area have been altered by bank and shore structures, urban development, transportation
 27 improvements, instream mining activities, flood-control works, agriculture, forestry, and other
 28 human activities.

29
 30 In 1998, the state reported that there were 1,022 dams obstructing flow of water in Washington;
 31 this number includes any structure that can store 10 or more acre-feet of water (Washington
 32 Department of Natural Resources 1998b). A large number of dams have been built in the

1 analysis area for a variety of purposes (Table 7). These dams not only alter natural patterns of
2 flow but also often act as impassible barriers to migrating salmonids. The Reclamation Act of
3 1902 resulted in an increase in irrigated lands in the Columbia Basin (Washington Department of
4 Natural Resources 1998b), which also affected stream flow patterns within the analysis area. In
5 the early 1930s, and continuing into the 1950s, Federal Bureau of Reclamation projects
6 constructed dams and irrigation systems throughout the semiarid lands in the analysis area.

7
8 When many dams and reservoirs were built, little consideration was given to their adverse effects
9 on salmonids and other fish and wildlife species. In the last two decades, some improvements
10 have been made to benefit fish and wildlife. When nonfederal hydropower dams are relicensed
11 under the Federal Power Act, operators may be required by the Federal Energy Regulatory
12 Commission and other regulatory agencies to release water during dry periods for fish and
13 wildlife (Blumm 2002).

Table 7. Major dams restricting fish access to habitat in the analysis area.

ESU	Dams/Reservoirs	Hydrologic Unit ¹
Puget Sound Chinook Salmon	Tolt Dam Landsburg Division Alder Dam Elwha Dam Howard Hanson Dam Mud Mountain Dam	Snoqualmie Lake Washington Nisqually Dungeness-Elwha Green-Duwamish White-Puyallup
Lower Columbia River Chinook Salmon	Condit Dam, The Dalles Dam Bull Run Dam 2 Merwin Dam	Middle, Columbia-Hood Lower Columbia-Sandy Lewis
Hood Canal Summer-run Chum Salmon	Cushman Dam	Skokomish
Snake River Basin Steelhead	Hells Canyon Dam Dworshak Dam	Hells Canyon Lower North Fork Clearwater
Lower Columbia River Steelhead	Bull Run Dam 2 Merwin Dam	Lower Columbia-Sandy Lewis
Upper Willamette River Steelhead	Big Cliff Dam Green Peter Dam	North Santiam South Santiam
Middle Columbia River Steelhead	Bonneville Dam McNary Dam Condit Dam Pelton Dam	Middle Columbia-Hood Lower Deschutes Lower Deschutes
Ozette Lake Sockeye Salmon	N/A	N/A
Columbia River Chum Salmon	N/A	N/A

¹ Hydrologic units are geographic areas representing part or all of a surface drainage basin or distinct hydrologic feature.

Source: Designated Critical Habitat: Critical Habitat for 19 Evolutionarily Significant Units of Salmon and Steelhead in Washington, Oregon, Idaho, and California, February 16, 2000 (65 FR 7764).

When cities and suburbs replace natural landscapes with buildings and paved surfaces, the percentage of impervious surface in a watershed increases. Roofs of buildings, roads, driveways, and parking lots all add to the impermeable surface in a watershed. The increase in impervious surface tends to increase the magnitude and frequency of flood flows in streams during wet periods and to decrease them in dry periods (U. S. Environmental Protection Agency 2001). Typical percentages of impervious surface for different land use types in the analysis area are

1 shown in Table 8.
2

3 **Table 8.** Percent imperviousness for various land use types in Pierce County, Washington.
4

5 Land Use Type	Percent Impervious (%)
6 Low density residential (4 houses per acre)	25
7 Low density residential (1 home per acre)	11
8 Multi-family residential	50
9 Public institutions	30-50
10 Industrial	85
11 Commercial	85
12 Open space	0-5
13 Agriculture	0-5

14
15 Source: Guidance for Basin Planning, Pierce County, Washington 2000.
16

17 Roadways can change streamflows. In urban areas where the road network is dense, and the
18 percentage of impervious surface is in the range of 80 to 100 percent, roads represent 20 to 35
19 percent of the total impervious surface (Pierce County, Washington 2000). For example, in a city
20 with 200-foot by 200-foot blocks and 50-foot roadways, the roadways represent about one-third
21 of the total impervious surface. In rural areas where there are few roads, the roadway percentage
22 of impervious surface is less than 5 percent (Pierce County, Washington 2000).
23

24 In urban areas, roads and highways usually drain to a network of underground storm sewers,
25 which ultimately discharge to surface waters, often at some considerable distance from the source
26 of the runoff. In rural areas, roads and highways typically drain to open roadside ditches where
27 water may percolate into the ground or flow to nearby surface streams or natural drainage
28 channels. However, when relatively impermeable road surfaces are combined with cutbanks,
29 fill-slopes, and roadside ditches, this can result in decreased infiltration and increased rates of
30 surface runoff. Roadcuts intercept subsurface flow while roadside ditches and newly formed
31 gullies downstream from culverts extend the stream network, creating a channel system that is
32 highly efficient in delivering surface runoff and sediments to stream channels (Interior Columbia
33 Basin Environmental Management Project 2000).

3.5 Water Quality

Along with water quantity, water quality is a critical component of aquatic and riparian habitats. Many of the human activities that adversely affect water quantity also degrade water quality. Impoundments, streambank and channel alterations, and disturbances of natural flow regimes can all affect water quality, as can the practice of using surface waters as the recipient for municipal, industrial, and agricultural wastewaters. The Programmatic EA for Limit 10 describes the factors that affect water quality, the major provisions in the Clean Water Act, and the responsibilities of states to monitor and report water quality data through publication of 303(d) lists identifying streams that exceed Clean Water Act standards (Limit 10 Programmatic EA, subsection 4.8, Water Quality). The Programmatic EA also describes the pollutants associated with runoff from roads. The same factors that impact water quality and the resultant trends in water quality degradation that are described in the Programmatic EA also occurs in the analysis area.

Currently in Washington, nearly 60 percent of the lakes, streams, and estuaries for which there is data fail to meet state water quality standards (Washington Department of Ecology 2000b). Table 9 identifies the number of stream miles in Washington out of compliance for selected water quality standards. Of the 1,099 bodies of water for which there are data, the Department of Ecology has identified 643 (59 percent) lakes, streams, and estuaries as impaired, meaning they do not adequately provide for swimming, fishing, or habitat (Washington Department of Ecology 1998). These impaired water bodies represent about 2 percent of all the waters in Washington. Only a small portion of the state's bodies of water have had their health assessed and it is possible that other unmeasured water bodies also exceed water quality standards at some time. In 1996, the Department of Ecology listed 611 water bodies as impaired, and the number of water bodies on the 1998 list increased by 32 over the 1996 list.

Table 9. Stream miles in Washington out of compliance with water quality standards.¹

	Stream Miles Listed for Selected Parameters				Total Listed Stream Miles
	Sediment	Nutrients	Pathogens	Toxics	
Washington	18	1	393	134	546

¹ Represents entire state data, and is not specific to boundaries within the 10 ESUs comprising the analysis area.

Source: Atlas of America's Polluted Waters, U.S. Environmental Protection Agency 2000.

The state has identified that the most common water quality problems in Washington's waters are fecal coliform bacteria contamination, elevated temperature, increased sediment in streams, and excess nutrients in lakes (Table 10). The following activities have been identified by the state as contributing to the pollution of the state's fresh water: 5.2 million vehicles on 80,000

1 miles of public roads; more than 36,000 farms on 15.7 million acres of land; 767 commercial
 2 dairies with 260,000 cows; 275 municipalities with existing residential, commercial and
 3 industrial sources; and about 40,000 additional homes built each year (Washington Department
 4 of Natural Resources 1998a).

5
 6 **Table 10.** Number of water bodies not meeting water quality standards in Washington.
 7

PARAMETER	1996 303(D) LIST	1998 303(D) LIST
Fecal coliform	312	313
Temperature	282	320
Dissolved oxygen	130	130
pH	126	88
Instream flow	49	45
Total phosphorus	43	26

15
 16 Source: Washington Department of Ecology 2001.

18 Roadways are a source of substances that, if washed into streams and rivers, can harm water
 19 quality and aquatic life. The movement of vehicles along roadways erodes material from the
 20 surface and margins of the roadway. Vehicles deposit oil and grease and materials derived from
 21 tires, brake pads, and other mechanical parts on the roadway surface. Travelers often dispose of
 22 litter within roadway rights-of-way. When rain falls or snow melts, the materials accumulated on
 23 the roadway surface are carried into the roadway drainage system and ultimately into the waters
 24 of the United States with varying levels of filtration. The Limit 10 Programmatic EA describes
 25 the characteristics of stormwater runoff from highways in urban and rural areas (Limit 10
 26 Programmatic EA, subsection 4.8.2, Roadways and Water Quality). These characteristics also
 27 apply to stormwater runoff in the analysis area.
 28
 29

30 3.5.1 Water Quality Regulations

31
 32 The Washington Department of Ecology has established surface water quality standards pursuant
 33 to Chapter 90.48 (Water Pollution Control Act) and Chapter 90.54 RCW (Water Resources Act
 34 of 1917) to protect uses of water beneficial to humans and wildlife. The following is a
 35 discussion of these standards as they apply to the analysis area.
 36

37 Section 303(d) of the Clean Water Act and the U. S. Environmental Protection Agency's

1 implementing regulations (40 CFR 130.2(j)) require the state to identify and list threatened and
 2 impaired waterbodies. The purpose of the 303(d) listing is to identify waterbody segments that
 3 are not expected to meet state surface water quality standards after implementation of
 4 technology-based controls. Every two years, the Washington Department of Ecology prepares a
 5 list of these “water quality limited” waterbodies for submittal to the U.S. Environmental
 6 Protection Agency for its review and approval.

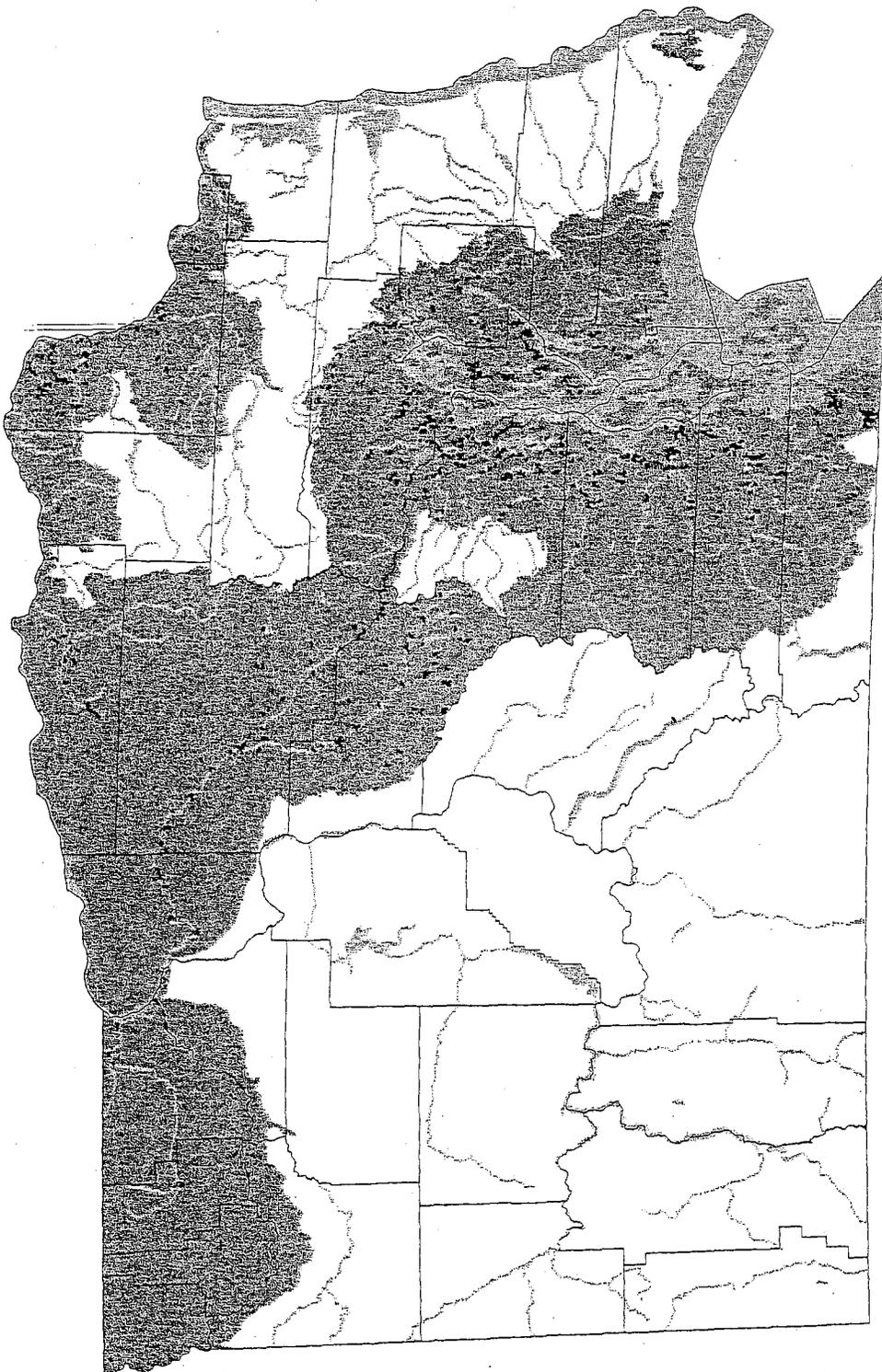
7
 8 In 1998, the Department of Ecology prepared a proposed list of water quality limited waterbodies
 9 for the state. Because the U.S. Environmental Protection Agency is preparing new rules and
 10 guidance, no list was required in 2000. The next 303(d) list is required in 2002. The 1998,
 11 303(d) list identified water quality problems in the analysis area (Figure 7). Approximately 244
 12 miles of freshwater and estuaries are listed as water quality limited for turbidity, temperature, and
 13 dissolved oxygen (Washington Department of Ecology)(Table 11).

14
 15 **Table 11.** Water bodies out of compliance with water quality standards in the analysis area.

PARAMETER	FRESHWATER	ESTUARIES	TOTAL LISTED STREAM MILES
Turbidity	2	0	0.28
Temperature	204	12	188.47
Dissolved Oxygen	65	19	55.34

16
 17
 18
 19
 20
 21
 22
 23 Source: Washington Department of Ecology 1998.

24
 25 Water quality listed streams are not evenly distributed across the analysis area. The majority of
 26 the 303(d) listed segments are concentrated in the Puget Sound watershed. Fewer listings are
 27 recorded along rivers in the central and eastern portions of the analysis area, with more listed
 28 segments reported along the Columbia River and its tributaries in the southern part of the
 29 analysis area. For example, the Columbia River in the vicinity of Longview, Washington, is out
 30 of compliance for dissolved oxygen, fecal coliform, temperature, PCBs, and total dissolved
 31 gases. The water quality exceedances in the analysis area are primarily due to fecal coliform,
 32 dissolved oxygen, temperature, chemical pollutants, and heavy metals. Table 12 lists selected
 33 waterbodies on the 303(d) list in the analysis area and the corresponding water quality parameter
 34 exceedance. To address water pollution issues, the state is required to complete a total maximum
 35 daily load allocation for all water body segments on the 303(d) list. Total maximum daily loads
 36 have been established for only a small proportion of the water bodies in the state that are not in
 37 compliance with ambient standards.

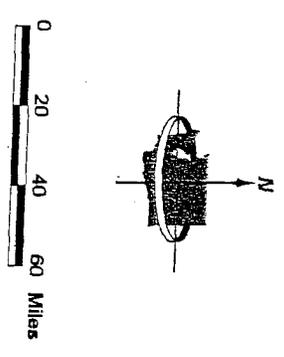


303(d) Status in the Analysis Area

Impaired Watercourses

- Turbidity
- Temperature
- Dissolved Oxygen
- Other Parameters
- Impaired Waterbodies/Estuaries
- Temperature
- Dissolved Oxygen
- Other Parameters

Analysis Area



August 2002

Data Sources: Lakes, Coastline and Counties from WSDOT at scale of 1:500K; Major Rivers from WADOE at scale of 1:100K; Analysis Area from NMFS 1998 303(d) Status from WADOE at scale of 1:100K.
Lambert Conformal Conic Projection,
Washington State Pils.
North American Datum.

Table 12. Selected waterbodies and corresponding pollutants on 303(d) list in analysis area.

RIVER/STREAM SEGMENT	303(D) WATER QUALITY PARAMETER	WATER RESOURCE INVENTORY AREA (WRIA) NAME AND NUMBER
Nooksack River	temperature, fecal coliform, fine sediment	Nooksack, WRIA 1
Green River	fecal coliform, temperature, mercury, chromium	Duwamish/Green, WRIA 9
Yakima River	dieldrin, PCB-1260, arsenic, mercury, temperature, turbidity, pH	Lower Yakima, WRIA 37
Lower Snake	dissolved oxygen, temperature, total dissolved oxygen	Lower Snake, WRIA 33
Lewis River	fecal coliform, temperature	Lewis River, WRIA 27
Clear Creek	fecal coliform	Kitsap, WRIA 15

Source: Washington Department of Ecology 1998.

As described in the Programmatic Limit 10 EA (Limit 10 Programmatic EA, subsection 4.8.2, Roadways and Water Quality), jurisdictions in the state with populations exceeding 100,000 are implementing measures designed to reduce the discharge of pollutants in stormwater runoff as stipulated in their Washington Department of Ecology Phase 1 National Pollutant Discharge Elimination System permits. Phase 1 municipalities are currently applying for reissuance of their stormwater permits and the Washington Department of Ecology is proposing to combine the three existing general permits for the Island/Snohomish, Cedar/Green, and South Puget Sound Water Quality Management Areas into one statewide general permit. The entities that have coverage under the current Phase 1 permits are: the Washington Department of Transportation, King County, Pierce County, Snohomish County, Clark County, and the City of Seattle and the City of Tacoma.

In rural and urban areas with a population of less than 100,000, a National Discharge Elimination System permit is not required to discharge urban runoff to waters of the United States, although permits are expected to be required for urban areas with populations between 10,000 and 100,000 in the next several years (Washington Department of Ecology 2002). In general, stormwater management plans for these areas have not been developed. Agencies responsible for roadway and road maintenance other than the seven Phase 1 permittees are not required to implement National Pollution Discharge Elimination System measures designed to reduce the discharge of pollutants in stormwater runoff, but some are doing so voluntarily.

3.5.2 Water Temperature

The factors that affect water temperature and the resultant impacts to salmonids and other aquatic life are described in the Programmatic EA (Limit 10 Programmatic EA, subsection 4.8.3, Water Temperature) and this information is also applicable in this sequential EA's analysis area. Temperature plays an integral role in the biological productivity of streams. Aquatic life is the beneficial use of the water that is most sensitive to water temperatures.

In Washington, the temperature standard for Class AA streams is that the water temperature shall not exceed 16.0 ° C (60.4° F) due to human activities. When natural conditions exceed 16 ° C, no temperature increase greater than 0.3° C is allowed (Washington Department of Ecology 1998). Elevated temperatures affect more than 280 (44 percent) of the state's 643 known impaired water bodies (Washington Department of Ecology 2000). More than half of the state's 62 stations monitoring water quality are rated poor or fair in having temperatures cold enough for healthy populations of salmon, steelhead, or trout (Washington Department of Ecology 2000).

216 water bodies in the analysis area are not in compliance with the state's water temperature standard (Washington Department of Ecology 2002c)(Figure 8). For example, in the Ozette basin, summer water temperatures are warmer than State water quality standards in Umbrella Creek, Crooked Creek, and Big River (McHenry et al. 1996), and North Fork Crooked Creek is on the 303(d) list for water temperature. Summer water temperatures in Ozette River were also warmer than optimal, with maximum temperatures reaching 20 ° C (68° F) on two dates in August, 1994, and equaled or exceeded 20 ° C on all sampled days from July to September of that year (Meyer and Brinkman 1995).

The example demonstrates the complexity of these exceedances. Increases in water temperature is a major determinant of water quality that affects aquatic life. This factor varies naturally in its characteristics across the landscape (as a function of geology, topography, and climate) as well as over time. The influence of heat on water quality can also be affected by changes associated with land use. Elevated temperatures generally occur in areas where trees and vegetation have been removed due to timber harvest or development activities (Washington Forest Practices Board 2001).

During the summer months in 2002, the Washington Department of Ecology measured stream temperatures in several Washington rivers using thermal imaging (infrared) technology. Data from Ecology's studies will be made available for landowners, tribes, local governments, watershed planning units, and state water-quality managers for planning stream restoration efforts, particularly in determining where to plant vegetation to decrease river temperatures.

Salmonids and some amphibians appear to be the most sensitive to water temperatures. Thus, they are used as indicator species regarding water temperature and water quality. The harmful effects of warm water on salmonids, include the following: decreased supply of oxygen,

1 disrupted metabolism, increased susceptibility to toxins, increased vulnerability to disease,
2 reduced ability to avoid predators, and reduced food supply (Washington Department of Ecology
3 2001).

6 3.5.3 Sediment and Turbidity

7
8 The factors that cause sediment to be transported to streams and rivers and the resultant impacts
9 to water quality are described in the Programmatic EA (Limit 10 Programmatic EA, subsection
10 4.4, Soils) and this information is also applicable in this EA's analysis area. Two of the most
11 common water quality parameters measured and monitored for sediment are suspended sediment
12 and turbidity. Both are related to sediment delivery and transport in hydrologic systems. In
13 streams, turbidity is usually a result of suspended particles of silts and clays, but also organic
14 compounds, plankton, and microorganisms.

15
16 Turbidity varies greatly as a result of natural factors, therefore, Washington has established a
17 standard for turbidity relative to background levels, rather than absolute standards. The
18 Washington Department of Ecology specifies that turbidity shall not exceed 5 nephelometric
19 turbidity units over background levels when the background level is 50 nephelometric turbidity
20 units or less, nor increase more than 10 percent when background is more than 50 nephelometric
21 turbidity units (Washington Department of Ecology 1998).

22
23 18 water bodies in the analysis area are not in compliance with the state's sediment and turbidity
24 standard (Figure 7). For example, Dogfish Creek in Kitsap County and the Longview Ditches in
25 Cowlitz County are on the 1998 330(d) list for exceedance of turbidity. The *Habitat Limiting*
26 *Factors* report for Water Resource Inventory Area 15 indicates that upstream of the crossing of
27 Bond Road, Dogfish Creek flows through two heavily used pastures that are in poor condition,
28 with unrestricted animal access to the entire section of the stream (Washington State
29 Conservation Commission 2000). Substrate in this section consists of almost entirely fine
30 sediments. Unrestricted animal access on at least four farms upstream of Big Valley Road was
31 also noted. Some livestock fencing was identified, but the fences were placed next to the stream,
32 leaving little to no buffer for vegetation except grass to grow. Longview Ditches are located in
33 WRIA 25. The *Habitat Limiting Factors* report is currently being prepared, therefore, little is
34 know regarding the source of the sediment.

35
36 Erosion from croplands accounts for 40 percent to 50 percent of the fine sediments affecting the
37 health of streams and rivers in Washington (Washington Department of Natural Resources
38 2000). Fine sediments deposited in streams and rivers can cover gravel bottoms, suffocating fish
39 eggs and young fish. Suspended sediments can clog the gills of fish, decrease the amount of
40 dissolved oxygen in the water, and stunt the growth of fish by making it difficult for fish to find
41 food.

3.5.4 Dissolved Oxygen

The sources of dissolved oxygen and the causes of the daily fluctuations in dissolved oxygen levels in streams are described in the Programmatic EA (Limit 10 Programmatic EA, subsection 4.8.5, Dissolved Oxygen) and this information is also applicable in this EA's analysis area. Dissolved oxygen refers to the concentration of oxygen dissolved in water. Adequate dissolved oxygen concentrations are important for supporting fish, invertebrates, and other aquatic life. Salmon and steelhead are particularly sensitive to reduced dissolved oxygen.

Washington has established dissolved oxygen standards designed to protect cold water fish, including salmonids. Compliance with ambient standards for dissolved oxygen is most problematic in the summer months in streams diminished by agricultural water diversions and unprotected by riparian vegetation. 65 water bodies in the analysis area are not in compliance with the state's dissolved oxygen standard (Figure 9).

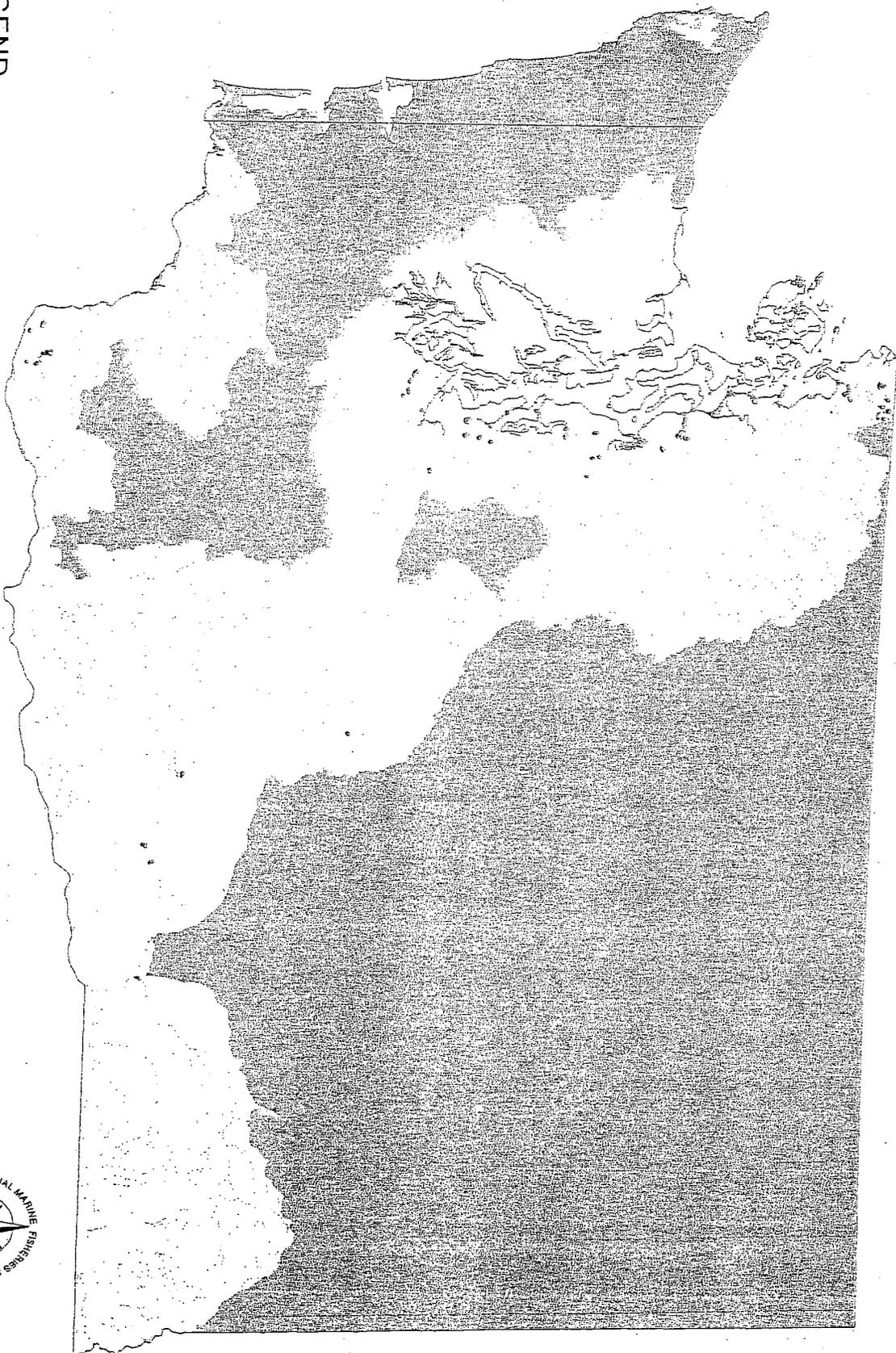
In addition to temperature, dissolved oxygen, and sediment, salmonids can also be adversely affected by a variety of toxic pollutants (National Research Council 1996). These contaminants can enter streams as chronic inputs, such as industrial effluent or runoff from agricultural and mining areas, or as episodic inputs, such as chemical spills during transportation or failure of containment structures. Effects vary depending upon the chemicals, exposure, and interactions with other chemicals, but can range from direct mortality and behavioral or morphological abnormalities to bioaccumulation of substances in tissues, making fish unsafe for human consumption (National Research Council 1996). The state's 303(d) list identifies rivers and streams in the analysis area that have exceedances of chemicals and heavy metals.

3.6 Fish

3.6.1 Fish

Aquatic ecosystems in the analysis area are highly diverse and produce a wide variety of species adapted to them. Washington has unique habitats ranging from temperate rainforest, to desert, to alpine, with transitional ecotypes between these more distinct habitats. Aquatic habitats are equally varied; from massive state and physiographic province-spanning watersheds to small marshes. With the exception of a few fish species adapted to specific regional habitat conditions, the majority of fish in the analysis area are widespread and distributed across many physiographic provinces within Washington. The status of fish in the analysis area ranges from Federally endangered native fish to populations of invasive species expanding at the peril of other co-occurring species.

1998 303(d) Listings for Dissolved Oxygen in the Analysis Area



LEGEND

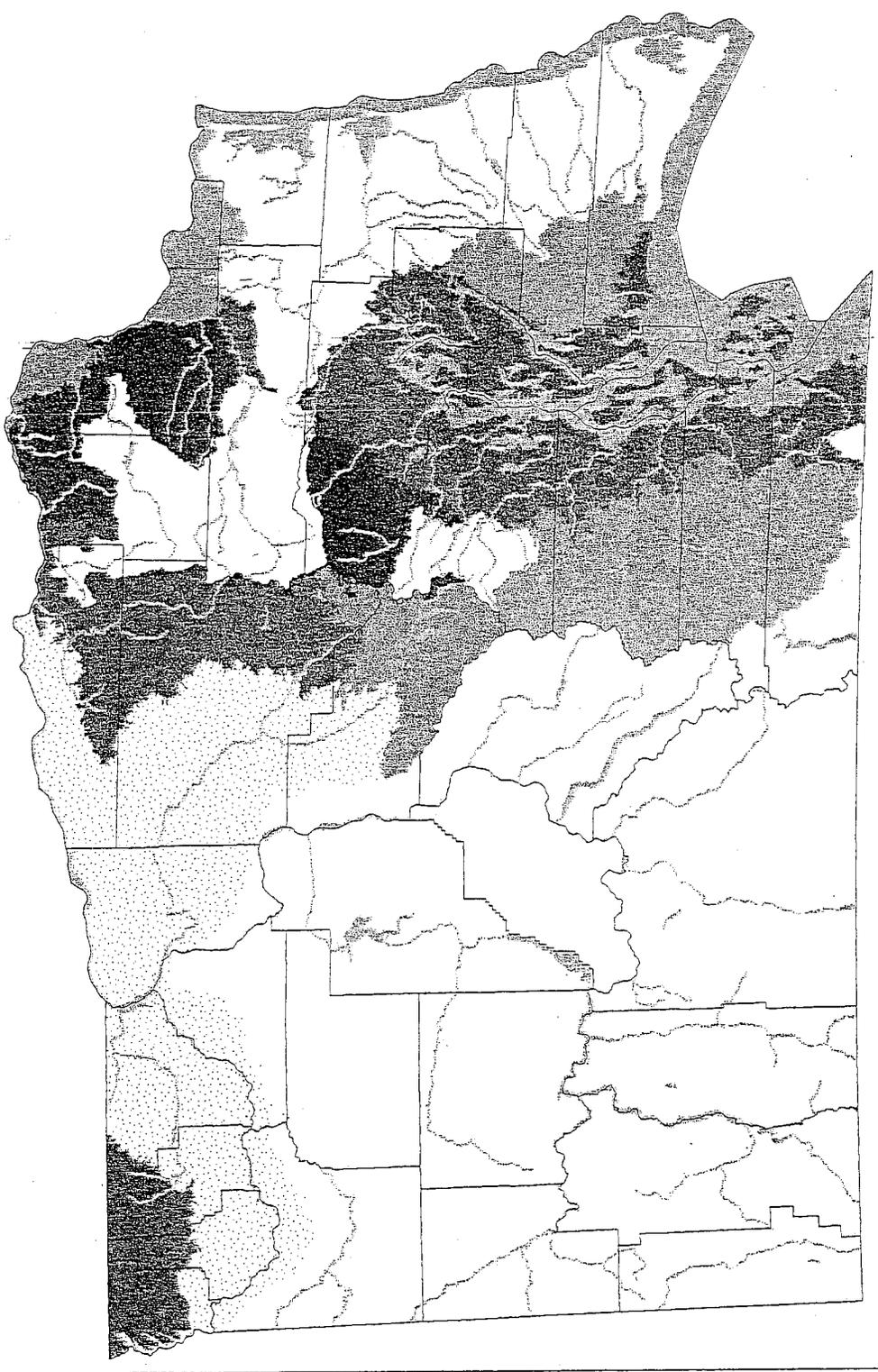
Streams in Analysis Area (1:250,000)

303 (d) listings for Dissolved Oxygen in Analysis Area (WA Dept. of Ecology)

Areas outside the Analysis Area (WA Dept. of Ecology)

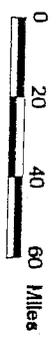
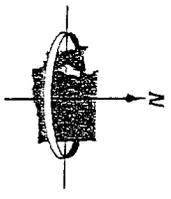


Figure 10 Ecoregions in the Analysis Area



Ecoregions in the Analysis Area

- Ecoregions**
- Blue Mountains
 - Columbia Basin
 - East Central Cascades
 - Inner Olympic Peninsula
 - Northwest Cascades
 - Outer Olympic Peninsula
 - Puget Trough
 - Southeast Cascades
 - Southwest Cascades
 - Willamette Valley



August 2002

Data Sources: Lakes, Coastline and Counties from WSDOT at scale of 1:300K; Major Rivers from VADOE at scale of 1:100K; Analysis Area from NMFS; Ecoregions from WDFW.

Lambert Conformal Conic Projection,
Washington State Plane,
North American Datum 1

3.6.1.1 Native Fish Species

The Limit 10 Programmatic EA describes the distribution and status of native fish taxa across four states (Limit 10 Programmatic EA, subsection 4.9.1, Fish) and many of these species are found in the analysis area. Seventy-seven fish species are recognized in Washington state, of which 51 are considered native (Smith and Collopy 2002). Within the analysis area's fresh and marine waters, native fish species include sculpins, flounders, perch, greenlings, rockfish, lamprey, various minnow, sucker species, and spiny dogfish. These species have a healthy population status. In the analysis area, native resident salmonids include rainbow and cutthroat trout, and mountain whitefish.

3.6.1.2 Invasive Fish Species

Non-native species have been introduced in the analysis area in large numbers through intentional state and Federal fisheries management actions, accidental release of aquarium fish, and illegal game fish stocking activities (Leubke 1978). The effects of co-occurring non-native fish range from benign to the total collapse and extinction of native stocks due to predation or competition. Other invasive fish threatening native species and their habitats in the study area include brook, brown, and lake trout (family Salmonidae); largemouth, smallmouth, and striped bass (family Moronidae); walleye (*Stizostedion vitreum*); bullhead (*Ameiurus spp.*); and mosquitofish (*Gambusia spp.*). Indigenous and non-indigenous salmonids introduced outside of their native ranges compete for food, space, and spawning areas (He and Kitchell 1990). In Washington, concerns are being raised about fish farming and escapement of pen-reared Atlantic Salmon into Puget Sound. Bass, walleye, bullhead, and mosquitofish are among the most voracious predators of salmonid eggs, fry, smolts, and small adults (Dentler 1993).

In the Columbia Basin, which includes Washington, as well as parts of Idaho and Oregon, 55 of the 143 fish species are non-native (Quigley and Arbelbide 1997). About half of the approximately 60 species of fish in the Snake River Basin are non-native (NOAA Fisheries 2000). Introductions of non-native species along with habitat modifications have increased predator populations in numerous river systems, and resulted in higher predation levels for salmon (Myers et al. 1998). Of the 77 fish species in the Columbia Basin found in Washington, 26 are non-native, including brook trout, large and smallmouth bass, walleye, and channel catfish, all species implicated in the decline of native species through competition or direct predation (Quigley Arbelbide 1997).

3.6.1.3 Threatened and Endangered Fish Species

The ESA provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The program is administered jointly by the Department of Commerce (through NOAA Fisheries) for most marine species and the Department of Interior (through U. S. Fish and Wildlife Service) for terrestrial species, for some marine, and for all freshwater species. Currently, 57 ESUs of West Coast salmonids have been listed (51 under the jurisdiction of NOAA Fisheries, 6 under the jurisdiction of the U. S. Fish and Wildlife Service). Twenty-six ESUs are currently listed as threatened or endangered under the ESA. The analysis area includes 10 threatened ESUs considered in the July 2000 4(d) rule (subsection 1.1, Introduction). These ESUs are described in Appendix C of the Limit 10 Programmatic EA and are incorporated herein by reference (NOAA Fisheries 2002). The ESU descriptions include information about life histories, species status, and factors for decline specific to each ESU.

Salmon and trout in the analysis area are anadromous, exhibiting a unique life history that takes place in both fresh and marine water. Anadromous fish spawn in freshwater, laying eggs in nests in the gravel called redds, and emerging as fry. The juvenile fish, referred to as parr or fingerlings as they increase in size, spend various amounts of time in freshwater and then begin their migration to the marine environment. Before reaching the marine environment, salmonids undergo physiological changes (smoltification) in preparation for marine life. Timing of migration and length of marine residence vary with species. To complete their life cycle, anadromous fish return to freshwater to spawn and die (except for steelhead, which can spawn multiple times before dying), generally to the streams in which they hatched.

Factors that contribute to the decline of Pacific salmonids include habitat loss and degradation, the effects of water development projects (e.g., hydropower dams, power plants, and water diversions), changes in stream flow patterns and amount of water, predation by and competition with hatchery fish (as well as genetic effects), fish harvest, disease, and inadequate regulatory mechanisms (National Marine Fisheries Service 1998a; Spence et al. 1996). These factors for decline are described here in a general way so that they may serve as a basis for the discussion of ESU-specific factors found in subsequent sections. Aspects of each factor for decline apply to all salmonids. The major factors for decline are described in Appendix D in the Limit 10 Programmatic EA and are incorporated herein by reference (NOAA Fisheries 2002). It is important to note that the factors for decline are often inextricably linked and, together, can affect salmonids in ways that make it difficult to isolate any one factor as the cause of population decline. Nonetheless, the ESU-specific discussions identify the primary factors for decline where it is possible to do so.

In addition to the 10 threatened ESUs described above, the U.S. Fish and Wildlife Service determined threatened status for all populations of bull trout (*Salvelinus confluentius*) within the coterminous United States on June 10, 1998. Historically bull trout occurred throughout the Columbia River Basin, yet today populations are found primarily in upper tributary streams and

1 several lake and reservoir systems. The threatened bull trout is present in Washington, and in a
2 variety of ecoregions (Bond 1992). The Washington Department of Fish and Wildlife has
3 designated it as a species of concern. Within the analysis area, for example, bull trout are known
4 to occur in the Skokomish River Basin. Bull trout require near pristine cold water habitat
5 conditions and may display pronounced response to the actions described in this limit. Appendix
6 B provides a complete list of Federally listed threatened and endangered species in Washington.
7
8

9 **3.6.1.4 Aquatic Habitat**

10
11 Prior to the 1950s, timber harvesting practices, grazing, recreation, and other land uses along
12 streams and rivers differed little from upslope harvesting practices: forests were used from ridge
13 to the stream's edge (U. S. Fish and Wildlife Service 1999). From the late 1800s until World
14 War II, logging operations dragged logs down stream channels to artificially created splash dams,
15 eventually releasing logs down the rivers to mills. These practices delivered large amounts of
16 sediments to streams, lakes, and estuaries; removed forest canopies and warmed water
17 temperatures; altered habitats associated with wood and greatly decreased future sources of wood
18 inputs; and simplified and narrowed floodplains (U. S. Fish and Wildlife Service 1999). Since
19 the arrival of settlers in the early 1800s, at least 50 percent and as much as 90 percent of riparian
20 habitat in Washington has been lost, fragmented, or extensively modified (Washington
21 Department of Natural Resources 1998a).
22

23 Within in the analysis area, many watersheds have experienced some levels of timber harvesting
24 with most of the timber production focused in Wahkiakum County, the eastern portions of Lewis,
25 Cowlitz, and Clark Counties, and Skamania County. Water-body impairments are often
26 associated with areas where the timber has been over harvested. Some watersheds, such as the
27 Upper Grays River in Wahkiakum County, which have experienced expansive timber harvest and
28 increased flows due to lack of runoff retention, have flooding problems throughout the basin.
29 Flooding can cause streambank erosion, deposition of fines, shallowing of streambeds, and
30 subsequent temperature warming downstream (National Marine Fisheries Service 2002).
31

32 The analysis area once contained extensive wetlands; however, lower portions of many
33 watersheds have historically been altered for agricultural uses, and more recent urban and
34 suburban development (subsection 3.8, Vegetation). For example, wetlands and estuary mud
35 flats in the Skagit River Valley were converted to farmland before the first surveys were made in
36 1889. The estimated 40 square miles of tidal estuary wetlands present before Euro-American
37 settlement have now been reduced to less than 3 square miles of wetlands, a 93 percent loss
38 (Washington Department of Natural Resources 1998a).
39

40 Substantial agricultural production occurs throughout the Lower and Middle Columbia River
41 watersheds. Conversion of habitat to agricultural lands has resulted in loss of riparian habitat,
42 unstable stream banks due to poor cattle exclusion devices, excessive chemical levels in the

1 water associated with pesticides and herbicides, high water temperature, low dissolved oxygen
2 levels, and high levels of fecal coliform (Washington Department of Ecology 1998)(subsection
3 3.5, Water Quality). Many streams exceed appropriate width/depth ratios, resulting in high
4 temperatures, sheet flow at high waters, and inadequate velocity levels at low flows. Agricultural
5 production has also increased disturbance related to invasive plant species. Within the
6 watersheds of the analysis area, several waterbodies have fish passage problems either due to
7 road crossings or small dams constructed for irrigation on agricultural lands.

8
9 Several hydropower projects including the Bonneville Dam on the mainstem Columbia River
10 have caused adverse effects directly to listed species and to habitat along the Lower Columbia
11 River. The series of dams along the Columbia River have blocked an estimated 12 million cubic
12 yards of debris and sediment that would otherwise naturally flow down the Columbia,
13 replenishing the shorelines along the Washington coast (NOAA Fisheries 2002)(subsection 3.4,
14 Water Quantity). Table 5 lists the dams and reservoirs for each ESU that restricts fish access to
15 habitat in the analysis.

16
17 Industrial harbor and port development have been substantial within the Lower Columbia River
18 watersheds, and along the mainstem Columbia River. One hundred miles of river channel within
19 the mainstem Columbia River and its estuary have been dredged as a navigation channel by the
20 U.S. Army Corps of Engineers since 1878. Originally dredged to a depth of a minimum of 20
21 feet in 1878, the Federal navigation channel of the lower Columbia River is now maintained at a
22 depth of 40 feet and a width of 600 feet. The average amount dredged each year is 5.5 million
23 cubic yards of material (NOAA Fisheries 2002b). In addition to loss of riparian habitat, and
24 disruption of benthic habitat due to dredging, several sediment exceedances, such as arsenic,
25 have been identified in Lower Columbia River watersheds in the vicinity of the ports and
26 associated industrial activities.

27
28 The fastest growing areas within the state include the Seattle metropolitan area in King County,
29 the Everett metropolitan area in Snohomish County, and the Bellingham metropolitan area in
30 Whatcom County, all located in the Puget Sound Basin. The Vancouver metropolitan area in
31 Clark County is the State's fastest-growing county in the Lower Columbia River watershed. The
32 most rapid growth rates in eastern Washington within the analysis area occurred in Grant and
33 Franklin Counties with populations for each increasing 30 percent between 1990 and 2000.
34 Other substantial growth occurred between 1990 and 2000 in Yakima and Benton Counties with
35 23,799 and 29,915 new residents, respectively (Washington Office of Financial Management
36 2001).

37
38 The impacts from development can have incremental effects on habitat that cumulatively result
39 in impacts to listed species. Some of the most common forms of impact to listed species from
40 development include: degradation of water quality and alteration of hydrology due to increase in
41 impervious surface, loss of riparian habitat, impacts to streams, and increased sedimentation
42 during construction.

Essential Fish Habitat

Lower Columbia River watersheds have also been substantially altered by sand and gravel mining activities both in the past and the present. Many streams and rivers have excessive sediment levels and unstable riparian areas due to in-stream mining and upland mining with poor sediment and erosion control measures (subsection, 3.5.3, Sediment and Turbidity).

The Pacific Fishery Management Council is one of eight Regional Fishery Management Councils established under the Magnuson-Stevens Act. The Pacific Fishery Management Council develops and carries out fisheries management plans for Pacific coast groundfish, coastal pelagic species, and salmon off the coasts of Washington, Oregon, and California. Pursuant to the Magnuson-Stevens Act, the Pacific Fishery Management Council has designated freshwater and marine Essential Fish Habitat for chinook and coho salmon (Pacific Fishery Management Council 1999). The Programmatic EA describes NOAA Fisheries' Essential Fish Habitat policy and its application in Washington, Oregon, and California (Limit 10 Programmatic EA, subsection 4.9.1.4, Aquatic Habitat). For purposes of this document, freshwater Essential Fish Habitat for salmon in Washington includes all streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to Pacific salmon, except upstream of impassable dams. In the future, should subsequent analyses determine the habitat above any impassable dam is necessary for salmon conservation, the Pacific Fishery Management Council will modify the identification of Pacific salmon Essential Fish Habitat (Pacific Fishery Management Council 1999). Marine Essential Fish Habitat for salmon in Washington includes all estuarine, nearshore, and marine waters within the western boundary of the U.S. Exclusive Economic Zone, 200 nautical miles offshore.

NOAA Fisheries' 4(d) rule ESA section 7 Biological Opinion on the Washington Limit 10 RRM Program submittal will also describe the environmental baseline condition of the aquatic habitat for the analysis area, and NOAA Fisheries' corresponding Essential Fish Habitat determination will evaluate the effects of the Proposed Action on Essential Fish Habitat in the analysis area.

3.7 Wildlife

3.7.1 Birds, Land Mammals, and Herptofauna

Washington has a diverse set of ecosystems where fish and wildlife have evolved and adapted for thousands of years. Species that occur in upland, riparian, estuarine, or marine habitats in the range of the 10 ESUs are analyzed in this section (Table 13). As with vegetation, wildlife associations vary generally by ecoregion (Figure 10). Wildlife species associations for individual ecoregions are provided in Appendix A. Mule deer are common throughout the analysis area, as well as other large mammals such as bobcat, mountain lion, and coyote. Birds and small mammals are numerous and varied by ecoregion. Habitat modifications have reduced populations of large mammals in some areas including grizzly bear and gray wolf populations.

1 Wildlife species selectively use certain habitats to varying degrees. O'Neil and Johnson 2001
2 analyzed data on wildlife species in Washington and Oregon to determine the level of association
3 for different habitats. The highest numbers of species were found in agricultural areas and
4 riparian/wetland areas, followed by forest/woodlands. The lowest numbers of species were
5 found in coastal areas.

6
7 Washington state has more than 640 vertebrate species, in addition to thousands of species of
8 invertebrates (Washington Department of Natural Resources 1998b). Table 13 gives a partial list
9 of the hundreds of species of birds, mammals, reptiles, and amphibian to be found in the area
10 inhabited by the 10 threatened salmonid ESUs. Though wildlife do not all have direct
11 interactions with salmonids, their sustained presence stands as an indicator of the health of the
12 ecoregions in which they dwell. That is, where native populations of wildlife species are strong
13 and diverse, the local ecology is more likely to be more productive than it is where the
14 populations are diminished or experiencing downward trends.

Table 13. A partial list of the wildlife species inhabiting the analysis area.

Birds	<p><i>Songbirds:</i> Warblers, flycatchers, finches, chickadees, thrushes, larks, blackbirds, swallows; e.g., evening grosbeaks, mountain bluebirds, varied and hermit thrushes, western meadowlarks, horned larks, kingbirds</p> <p><i>Cavity Nesters:</i> Flickers, woodpeckers, nuthatches, buffleheads, wood ducks, some owls, and sapsuckers; e.g., Pileated woodpeckers, black-backed woodpeckers, Northern flickers, burrowing owls, red-napped sapsuckers</p> <p><i>Raptors/Scavengers:</i> Vultures, hawks, falcons, owls, crows, jays, eagles, ospreys, gulls; e.g., Steller's jays, red-tailed hawks, kestrels, bald eagles, golden eagles, magpies, turkey vultures, marsh hawks, common ravens, Swainson's hawks</p> <p><i>Upland gamebirds:</i> Pheasant, quail, grouse, partridges, chuckar, and turkeys; e.g., blue, sage, and ruffed grouse; California and mountain quail, mountain partridges</p> <p><i>Waterfowl:</i> Ducks, geese, widgeons, coots, scaups, and grebes; e.g., wood, ruddy, pintail, and harlequin ducks; mergansers; Canada geese; common mergansers</p> <p><i>Shore-, sea-, and water birds:</i> Sandpipers, dunlins, plovers, puffins, cormorants, herons, guillemots, murrelets, terns, and murres; e.g., Caspian terns, common murres, pigeon guillemots, tufted puffins, marbled murrelets, great blue herons, black-capped night herons, double-crested cormorants, American avocets, sandhill cranes, lesser yellowlegs</p>
Land Mammals	Black bears, grizzly bears, elk, mule deer, mountain goats, pronghorn antelope, river otters, bighorn sheep, mountain lions, beavers, nutria, muskrats, lynx, bobcats, badgers, fishers, squirrels, bats, blacktail deer, coyotes, grey wolves, shrews, voles, rabbits, hares, porcupines, skunks, mice, racoons, opossums
Herpetofauna (Reptiles and Amphibians)	Lizards, snakes, turtles, frogs, toads, salamanders, and newts; e.g., western fence lizards, Dunn's salamanders, red-legged frogs, tailed frogs, yellow-legged frogs, Northern alligator lizards, painted turtles, common garter snakes, rubber boas, Great Basin spadefoot toads, western rattlesnakes, western skinks, gopher snakes
Marine Mammals	Grey whales, killer whales, harbor seals, eared seals, Stellar's sea lions, sea otters

3.7.2 Threatened and Endangered Wildlife Species

The U.S. Fish and Wildlife Service, under the authority of the ESA, has identified species considered threatened or endangered because of low population numbers or other substantial threats to their survival, as well as candidate species being considered for formal listing. Wildlife on the Federal threatened and endangered species list for Washington includes 39 species of mammals, birds, reptiles, amphibians, insects, and fish (Appendix B). Although no additional species have been proposed for listing, NOAA Fisheries is reviewing the status of nine species that are currently on the candidate list (Washington Department of Fish and Wildlife 2001). Status reviews will determine whether or not the Federal agencies will list the candidate species. Of the nine species on NOAA Fisheries' candidate list, the species in the analysis area include Puget Sound/Strait of Georgia coho and Lower Columbia River/Southwest Washington coho.

The Washington Department of Fish and Wildlife maintains a priority habitats and species list of those species identified within the state of Washington because of population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. The state has 14 state-listed species, 20 candidates, and no proposed species, that are not Federally listed, or candidates (Washington Department of Fish and Wildlife 2001).

In the analysis area along Washington's coast, Puget Sound, and eastward to the Lewis River, Federal and state listed species include, but are not limited to, sea otter, Stellar's sea lion, humpback whale, leatherback sea turtle, loggerhead sea turtle, Columbian white-tailed deer, marbled murrelet, brown pelican, snowy plover, purple martin, bald eagle, northern spotted owl, sandhill crane, western pond turtle, Dunn's salamander, Van dyke's salamander, short-tailed albatross, Canada lynx, and the Oregon silverspot butterfly (Csuti et al. 1997; Sibley 2000; Leonard et al. 1993; Storm and Leonard 1993).

Within the Cascade Mountains in the analysis area, Federal and state listed species include, but are not limited to, grizzly bear, gray wolf, wolverine, Harlequin duck, bald eagle, golden eagle, the Cascade torrent salamander, Canada lynx, marbled murrelet, and northern spotted owl (Csuti et al. 1997; Sibley 2000; Leonard et al. 1993; Storm and Leonard 1993).

Federal and state listed species in the analysis area associated with the Washington portion of the Columbia Plateau province include, but are not limited to, the black-tailed jackrabbit, Washington ground squirrel, northern goshawk, golden eagle, peregrine falcon, burrowing owl, white-headed woodpecker, sandhill crane, sharp-tailed grouse, and sage sparrow (Csuti et al. 1997; Sibley 2000).

Dietary and habitat requirements vary greatly from one species to another. However, one threatened species, the bald eagle, which is found in all of the physiographic provinces under

1 study in Washington, and has been shown to prey on large numbers of salmonids. In a study of
2 bald eagles on the lower Columbia River, Garret et al. (1988) noted that salmonids comprised
3 approximately 12 percent of the diet. In *The Bald Eagle*, Stahlmaster (1987) presents the results
4 of 20 foraging studies with widely varying results based upon locality.
5

6 Another threatened species that has a negative effect on at least one salmonid population is the
7 Steller's sea lion (NOAA 1997).
8
9

10 3.8 Vegetation

11
12 Vegetation status is described below by physiographic province. The 10 ESUs in the analysis area
13 span the three physiographic provinces: the Pacific Border, the Cascade Mountain, and the
14 Columbia Plateau. The physiographic provinces are described in the Limit 10 Programmatic EA
15 and are incorporated herein by reference (NOAA Fisheries 2002). This discussion also provides
16 vegetation information at a more detailed scale (ecoregion level). Ecoregions are geographic
17 groupings of ecologically similar areas (Bailey 1995). Bailey's (1995) system of classification is
18 hierarchical; it contains different levels of classification. Domains, divisions, and provinces are
19 three levels of grouping, with domains being the least detailed, and provinces being the most
20 detailed. In this discussion, ecoregions are described at the province level. Ecoregion provinces
21 share common features of soil, climate, geology, and hence, vegetation. The analysis area spans
22 all or part of 10 ecoregions (Figure 10) and encompasses numerous vegetation zones (Figure 11).
23 Appendix A provides more detailed summaries of the vegetation and wildlife in these
24 ecoregions.
25
26

27 3.8.1 Pacific Border Province

28
29 The Pacific Border province intersects with seven ecoregions. Of these seven ecoregions, the
30 Cascade Mixed Forest and Pacific Lowland Mixed Forest ecoregions lie in Washington.
31

32 In the Pacific Border province, coastal areas are generally forested. Coastal forests (Cascade
33 Mixed Forest ecoregion) in Washington are primarily coniferous, dominated by Douglas-fir
34 (*Pseudotsuga menziesii*) and hemlock (*Tsuga heterophylla*), including some of the world's
35 largest trees (Smith and Collopy 2002). In valleys further inland in Washington (Pacific
36 Lowland Mixed Forest ecoregion) coniferous forests also contain deciduous species, including
37 big-leaf maple (*Acer macrophyllum*), black cottonwood (*Populus balsamifera*), and Oregon ash
38 (*Fraxinus latifolia*). Forested areas in this ecoregion are interspersed with wetlands and
39 grasslands containing tree species such as Oregon white oak (*Quercus garryana*) and Pacific
40 madrone (*Arbutus menziesii*) (Smith and Collopy 2002; Bailey 1995).
41

1 Extensive logging has occurred in forested areas in the Pacific Northwest during the last 50
2 years. By 1988, estimates of the status of coastal forests indicated that 75 percent of
3 Washington's forests had been previously logged (Kellogg 1992). Logging activities have
4 altered the age structure of forest trees and increased forest fragmentation (i.e., forested areas
5 occur in small, isolated patches), which may have implications for wildlife function and
6 distribution (Smith and Collopy 2002).

7
8 In the Pacific Coastal ecoregion, the most diverse vegetative communities occur in riparian areas
9 (Naiman 2000). Riparian areas are characterized by numerous deciduous species including
10 willow (*Salix* sp.), cottonwood (*Populus* sp.), and alder (*Alnus* sp.). Estuaries (coastal wetlands)
11 are often represented by tidal flats and salt marshes. Tidal flats support eelgrass (*Zostera* sp.),
12 surfgrass (*Phyllospadix* sp.), and algae (*Enteromorpha* sp.). Pickleweed (*Salicornia virginica*) is
13 found in tidal flats that border salt marshes. Salt marshes further upland are characterized by
14 saltgrass (*Distichlis spicata*), jaumea (*Jaumea carnosa*), sedge (*Carex* sp.), and alkali grass
15 (*Puccinellia pumila*) (Chappell et al. 2001).

16
17 Wetland loss and degradation has been reported throughout the analysis area. In the Columbia
18 River Basin, over 50 percent of historic estuarine marshes and spruce swamps have been
19 converted to other uses (Bonneville Power Administration 2001a). Between the 1780s and the
20 1980s, Washington lost 31 percent of the state's 1.35 million acres of wetlands (Dahl and
21 Johnson 1991; Dahl 1990). By 1979, the state had lost an estimated 70 percent of the estuarine
22 wetlands that existed before 1800, with approximately 907,709 acres of wetlands remaining
23 statewide (Washington Department of Natural Resources 1998a). Diking, dredging, agriculture,
24 and urbanization have been the primary causes of loss of wetlands in Washington. Roads tend to
25 be constructed in riparian areas, thus replacing valuable vegetation.

26 27 28 **3.8.2 Cascade Mountains Province**

29
30 The Cascade Mountains province contains the Cascade Mixed Forest ecoregion in Washington.
31 Forests on the eastern side of the Cascades support fire-adapted species such as ponderosa pine
32 (*Pinus ponderosa*), western larch (*Larix occidentalis*), and lodgepole pine (*Pinus contorta*).
33 Historically, fires occurred frequently, reducing understory vegetation. Logging and fire
34 suppression have resulted in densely forested stands and altered forest species composition.
35 These factors have contributed to insect infestations and high-intensity fires, raising concern
36 about forest health (Smith and Collopy 2002).

3.8.3 Columbia Plateau Province

The Columbia Plateau province spans three ecoregions. The Intermountain Semidesert ecoregion comprises the largest area encompassing large portions of Washington. The Great Plains – Palouse Dry Steppe ecoregion covers a smaller area on the border of southern Washington and northern Idaho. The Middle Rocky Mountain Steppe ecoregion covers most of northeastern Oregon, extending somewhat into Washington and Idaho.

Sagebrush steppe, supporting species such as shadscale (*Atriplex confertifolia*), sagebrush (*Artemisia* sp.), and short grasses, characterizes the vegetation of the Intermountain Semidesert ecoregion (Bailey 1995). Riparian areas in mountainous locations in this ecoregion support sedges (*Carex* sp.) and willow (*Salix* sp.) (Bailey 1995).

A variety of species characterize the grasslands of the Great Plains - Palouse Dry Steppe ecoregion including buffalo grass (*Buchloe dactyloides*), grama (*Bouteloua* sp.), blazingstar (*Liatris* sp.), white prickly poppy (*Argemone* sp.), and the introduced Russian-thistle (tumbleweed) (*Salsola* sp.). Trees and shrubs, such as sagebrush (*Artemisia* sp.), and rabbitbrush (*Chrysothamnus* sp.), also occur in some locations in the ecoregion (Bailey 1995).

In dry mountainous areas to the east (e.g., Middle Rocky Mountain steppe ecoregion), low elevations support shrubs (sagebrush), and grasses. Ponderosa pine forests occur at low mountain elevations; high elevations are dominated by Douglas-fir, with some grand fir (*Abies grandis*) association (Bailey 1995).

Livestock grazing has had widespread impacts on native vegetation throughout the west since the 1860s. It is estimated that 70 percent of the land area in the western United States is grazed (Stohlgren 2002). Regulation of grazing began in 1934 with the passage of the Taylor Grazing Act, but effects of grazing before this legislation are still in existence, and other damaging grazing practices continue to occur (Oregon Progress Board 2000). Grazing changes the distribution and structure of native plant communities and may result in erosion, decreased water availability, and increases in weedy species (Stohlgren 2002). The non-native species cheatgrass (*Bromus tectorum*) has become widespread and out competes local flora (Stohlgren 2002; Smith and Collopy 2002). Estimates indicate that cheatgrass is the dominant species on about 16.8 million acres and has the potential to spread to 62 million more acres (Smith and Collopy 2002).

Roads can affect the distribution of native and invasive plant species. For example, humans can inadvertently spread plants along transportation corridors if the plant's seeds become attached to mud on vehicles, or become embedded in tires, and are moved from one site to another. However, RRM activities could enhance native plant success by removal or mowing of roadside vegetation including noxious weeds, such as Himalayan blackberry (*Rubus spp.*) or Scotch broom (*Cytisus scoparius*) (Oregon Department of Transportation 1999).

1 Large amounts of native vegetation have also been lost due to conversion to cropland.
2 Agriculture has resulted in the loss of 99.9 percent of the Palouse prairie in Washington, Oregon,
3 and Idaho (Noss et al.1995).The remaining area experiences livestock grazing, with 30 percent
4 being heavily grazed (Smith and Collopy 2002). Fire suppression has also been practiced in
5 forests and grasslands throughout the Columbia Plateau, resulting in changes in native plant and
6 animal species distribution (Stohlgren 2002; Oregon Progress Board 2000).

9 **3.8.4 Threatened and Endangered Plant Species**

10 Washington state contains six Federal threatened plants, four endangered (Bradshaw's desert-
11 parsley, marsh sandwort, showy stickseed, and Wenatchee Mountains checker mallow), five
12 candidates for listing (basalt daisy, northern wormwood, slender moonwort, Umtanum desert
13 buckwheat, and white bluffs bladderpod), and one plant proposed for listing under the ESA. In
14 addition, the Washington Department of Natural Resources lists 57 threatened plants that are not
15 listed Federally or candidates for such listing (Washington Department of Natural Resources
16 2001).

17
18
19 The Pacific Border province of Washington provides habitat for many rare plants including, but
20 not limited to, queen-of-the-forest, ocean-bluff bluegrass, tall bugbane, howellia, golden
21 paintbrush, adder's-tongue, and hairy-stemmed checkermallow (Washington Natural Heritage
22 Program 2002).

23
24 Washington's Cascade Mountains provide habitat for many rare plants including rosy owl clover,
25 tall bugbane, Whited's milk-vetch, Wenatchee larkspur, Chelan rockmat, Seely's silene, pale
26 blue-eyed grass, and adder's-tongue (Washington Natural Heritage Program 2002). The
27 Columbia Plateau province of Washington provides habitat for many rare plants including basalt
28 daisy, Kalm's lobelia, Hoover's desert-parsley, dwarf evening-primrose, and Hoover's tauschia
29 (Washington Natural Heritage Program 2002).

31 **3.9 Federal Treaty and Trust Responsibilities; Tribal Rights and Interests**

32
33
34 This section describes the specific cultural, historical and legal context for the special
35 relationship the U.S. government has with American Indian tribes, including Federal trust
36 responsibilities, tribal rights and interests, and existing Federal relations with the tribes in the
37 analysis area. The U.S. government has a unique responsibility to Indian tribes with regard to
38 tribal rights and interests, especially the condition and status of many natural resources.

39
40 American Indians have occupied the analysis area for more than 12,000 years, but in the last two
41 centuries traditional tribal cultures and land uses have undergone substantial displacement. The

1 steady growth of Euroamerican populations has caused conflicts over resource use and
2 availability, as well as pressures to change Indian cultures. The competition and conflict between
3 native and Euroamerican people in the 1800s resulted in a treaty-making period between tribes
4 and the U.S. government through the mid- to late nineteenth century.

5
6 These treaties were agreements between sovereign nations, through which the U.S. government
7 recognized tribes as political entities. In the treaties, most tribes ceded lands in exchange for set-
8 asides, exclusive-use reservations, services and promises of access to traditional uses such as
9 hunting, fishing, gathering and livestock grazing. In exchange for cessation of Indian claims to
10 land, the Federal government assumed trust obligations on behalf of the tribes to protect tribal
11 assets and pre-existing rights allowing Indians to fish at usual and accustomed areas, and to hunt,
12 gather, and graze livestock on open and unclaimed lands (U.S. Army Corps of Engineers 1999).

13
14 In addition, presidential executive orders were signed in the late 1800s and early 1900s to reserve
15 lands for tribal use, identify certain services and identify rights for non-treaty tribes. In 1998 and
16 2000, former President Clinton signed Executive Orders on Tribal Consultation and Federalism.

17
18 Both orders were designed to strengthen the government-to-government relationship with Indian
19 tribes and to ensure that all executive departments and agencies consult with tribes as they
20 develop policy on issues that impact Indian communities.

21
22 There have been judicial interpretations of tribal rights and treaty language defining Federal legal
23 responsibilities. For example, a 1994 court decision involving shellfishing rights determined that
24 treaty-reserved resources were not limited to those actually harvested at treaty time because the
25 right to take any species, without limit, pre-existed the treaties (*United States v. Washington*).
26 Congress also adopted laws and policies that protect tribes' rights to self-determination and
27 promote the social well-being of tribes and their members. Under various laws and policies
28 therefore, Federal agencies have a responsibility to implement Federal resource laws in a manner
29 consistent with tribes' abilities to protect their members, to manage their own resources, and to
30 maintain themselves as distinct cultural and political entities.

31
32 Today's tribal cultural, social, economic, religious, and governmental interests and treaty-
33 reserved rights are dependent on landscape health, terrestrial source habitats, terrestrial and
34 aquatic species, and aquatic resources. Therefore the primary focus of the Federal trust
35 responsibility continues to be the protection of such Indian-owned assets, natural resources on
36 reservations, the treaty rights, and interests that were reserved for tribes on off-reservation lands.

37
38 For their part, tribal governments have broad social and natural resource responsibilities toward
39 their memberships and often operate under different cultural and organizational intents than
40 Federal or state agencies. Tribes have interests in reservations, Indian allotments and certain off-
41 reservation lands. However, the nature of such interests and legal rights varies. For example,

1 some tribes have a legal right to fish at all usual and accustomed places specified in treaties, for
2 both on and off reservation lands, regardless of property ownership. A list of tribal governments
3 in the analysis area in Washington is found in Appendix C.

4
5 Some tribes have established inter-tribal commissions to comprehensively manage resource
6 activities. The Northwest Indian Fisheries Commission and the Columbia River Inter-Tribal Fish
7 Commission are involved in fisheries management, artificial propagation of salmon programs
8 and salmon restoration plans.

9
10 As discussed in the Programmatic EA for Limit 10, salmon have particular cultural significance
11 to American Indians and for the tribes in the analysis area for this sequential EA (Limit 10
12 Programmatic EA, subsection 4.16, Environmental Justice). It is a food source, a symbol of
13 persistence and strength in a life cycle struggle, an economic industry, a prized game fish, a
14 regional political and environmental issue and a symbol of the Pacific Northwest region. For
15 many American Indians in the analysis area, the significance of salmon is founded in their
16 religions, socio-cultural values, and identity as a community or people. Many tribes in the
17 analysis area manage fisheries and salmon propagation facilities to preserve their culture and
18 provide treaty-fishing rights to their members.

19 20 21 **3.10 Environmental Justice**

22
23 Executive Order 12898 (59 Fed Reg. 7629, 1994) states that Federal agencies shall identify and
24 address, as appropriate "...disproportionately high and adverse human health or environmental
25 effects of [their] programs, policies and activities on minority populations and low-income
26 populations...". While there are many economic, social, and cultural elements that influence the
27 viability and location of such populations and their communities, certainly the development,
28 implementation and enforcement of environmental laws, regulations and policies can have
29 impacts. Therefore, Federal agencies, including NOAA Fisheries, must ensure fair treatment,
30 equal protection and meaningful involvement for minority populations and low-income
31 populations as they develop and apply the laws they are responsible for. Similar to the Limit 10
32 Programmatic EA, the analysis area has minority and low income populations that this Executive
33 Order could apply to, including Native American Indian tribes, and Hispanics.

34
35 The population of the analysis area is culturally diverse. Native Americans, comprising about 1
36 percent of the populations, reside throughout and retain rights to fish and shellfish resources
37 within the analysis area (U.S. Census Bureau 2001). African-American and Asian population
38 sectors make up 4 to 6 percent of the population, respectively (U.S. Census Bureau 20021).
39 Hispanic individuals, of any race, make up 7 percent of the population (U.S. Census Bureau
40 2001). At 81 percent, individuals of Caucasian background constitute the majority of the
41 population in counties intersecting the analysis area (U.S. Census Bureau 2001). The percentage

1 of individuals of Caucasian background in the analysis area is higher than the 71 percent
 2 Caucasian population in the Programmatic Limit 10 EA (Limit 10 Programmatic EA, subsection
 3 4.11, Demography). Percentages of the other races, however, are consistent with those in the
 4 Programmatic EA. Appendix D summarizes the ethnicity data by county that intersect with the
 5 analysis area. There are also a variety of active community and special interest based groups in
 6 the analysis area, including groups representing river transporters, irrigators, industries, sport
 7 fishing, agriculture, forestry, urban, and environmental interests.

8
 9 The percentage of the total population, outside of tribal reservations, that falls within ethnic
 10 groups represented in the 28 counties where the RRM activities would be implemented is
 11 provided in Table 14 as measured by the U.S. Census Bureau (U.S. Census Bureau 2001). The
 12 Asian population is the fastest-growing ethnic group in all regions of the nation, closely followed
 13 by the Hispanic origin population (Campbell 1996). Hispanic populations traditionally were
 14 found in agricultural areas drawn by jobs on farms and in food processing plants. More and more
 15 first and second generation Hispanics now live and work in urban areas, where there are
 16 increasing employment and business opportunities. Washington is projected to be the fifth most
 17 populous state among Native Americans by 2025 (Campbell). Appendix C lists Native
 18 American Indian tribal governments in the analysis area.

19
 20 **Table 14.** Percent ethnicity in 2000 in the 28 counties that intersect the analysis area.

Ethnicity in 2000	Percent (%)
Caucasian	81
African American	4
Asian	6
Native American	1
Hispanic	7
Other	1

22
 23
 24
 25
 26
 27
 28
 29
 30 Source: U.S. Census Bureau 2001.

31
 32 In December 2001, the Bureau of Labor Statistics reported that Washington and Oregon had the
 33 highest unemployment rates in the nation . In May 2002, the Bureau reported that the seasonally
 34 adjusted unemployment rate for Washington was 7.1 percent. Unemployment rates are not
 35 consistent for metropolitan areas in the analysis area (Table 15).

Table 15. Unemployment rates for metropolitan areas in the analysis area.

Metropolitan Area	Unemployment Rate (%)
Seattle-Bellevue-Everett	5.2
Bremerton	6.0
Tacoma	6.4
Bellingham	6.8
Richland-Kennewick-Pasco	7.2
Yakima	11.3

Source: U. S. Bureau of Labor Statistics 2002.

In 2000, the median household income for the state was \$41,715, with 22 counties in the analysis area having median household incomes below the state average (U.S. Census Bureau 2001). Approximately 10 percent of the state's population lives below poverty and 17 counties in the analysis area have more than 10 percent of their population living below poverty. For example, within Yakima County and Franklin Count, 18.3 percent and 17.7 percent of the population live below poverty, respectively (U.S. Census Bureau 2001). The percentage of persons living in poverty in Washington had increased from 8.8 percent in 1998 to 9.5 percent in 1999 (U.S. Census Bureau 2001).

Many of the tribes in the analysis area share the history of a culture and subsistence economy based on salmon. The decline of salmon has altered traditional tribal economies, and reduced wealth, health, and well being. The socioeconomic conditions for tribal members in particular are not on par with their non-Indian neighbors (Bonneville Power Administration 2001). Low-income fishing communities have also felt the effects of the decline in salmon, though it is estimated to be to a lesser extent than effects on Native Americans (Bonneville Power Administration 2001).

4.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

4.1 Introduction

This section describes the potential environmental consequences of each of the alternatives. The analyses of environmental consequences is conducted at the “project” level; that is, the analyses focus on the on-the-ground effects in the analysis area of the specific RRM Program submitted by jurisdictions in Washington State. This section also tiers off the Limit 10 Programmatic EA (NOAA Fisheries 2002). This section describes the effects of implementing each alternative for the environmental elements described in Section 3.0, Affected Environment. Table 16 summarizes the potential environmental consequences of the alternatives. The four alternatives are described in Section 2.0, Alternatives.

The following environmental consequences are analyzed at the watershed scale and (where possible) at the reach scale. Activities under different alternatives may have reach scale impacts that do not, however, affect resources at the broader watershed scale.

4.2 Soils

4.2.1 Alternative 1- No Action

Under the No Action Alternative, road maintenance activities would continue with existing practices for erosion control and water quality protection, as well as other activities that may dislodge sediments and expose soils. Consequently, at the reach scale, implementation of this alternative could result in continued movement of soils resulting from a variety of maintenance practices conducted adjacent to or above a stream. These practices would include road shoulder blading, excavation, drilling, grading, grubbing, cleaning, movement of heavy equipment, shoreline stabilization work, and winter sanding (Regional Road Maintenance Technical Working Group 2002). The use of heavy equipment may compact soil, which could cause changes in soil density. The compacted soil may create conditions that favor colonization by exotic or undesirable plant species and prevent native plant species from recolonizing the work site. When roads are adjacent to streams or riparian areas, soils may move into streams at the reach scale unless current laws within a jurisdiction require best management practices to reduce the effect. Soil movement would continue at the reach scale resulting in localized water quality impacts, with the potential for localized impacts to aquatic habitat for macroinvertebrates and fish.

At the watershed scale, RRM activities within the NPDES permitted Phase 1 jurisdictions’ area would continue to comply with the Clean Water Act and various state and local regulations that require implementation of erosion control measures aimed at water quality protection (subsection 3.2, Soils). While maintenance activities may result in localized sediment displacement, these activities would not substantially impact soil conditions at the watershed scale under the No Action Alternative.

Table 16. Summary of potential environmental impacts associated with each alternative.

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<p>SOILS</p> <p>RRM activities would continue with existing practices for erosion control. Impacts could occur at the reach scale from maintenance practices such as shoulder blading and winter sanding. Soils may enter streams at riparian areas adjacent to roads, unless minimized by current laws requiring best management practices. No impacts would occur at the watershed scale.</p>	<p><i>No Action.</i></p> <p>RRM activities would continue with existing practices for erosion control. Impacts could occur at the reach scale from maintenance practices such as shoulder blading and winter sanding. Soils may enter streams at riparian areas adjacent to roads, unless minimized by current laws requiring best management practices. No impacts would occur at the watershed scale.</p>	<p><i>Proposed Action: Approve RRM Program from Jurisdictions in Washington State.</i></p> <p>Same as the No Action, except RRM practices would meet properly functioning conditions required for RRM Limit 10(ii) approvals, which could minimize soil structure impacts, where current laws aimed at soil erosion do and do not exist. No impacts would occur at the watershed scale.</p>	<p><i>Approve Program Comparable to the Oregon Department of Transportation's RRM Program</i></p> <p>RRM Plans meet or exceed ODOT Guide for RRM Limit 10(i) approvals and effects would be the same as the Proposed Action.</p>	<p><i>Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures</i></p> <p>Same as Proposed Action over the long term. Short term benefits would be realized at the reach scale where mitigation would be provided.</p>

1
2
3
4
5

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
AIR QUALITY	<p>No Action.</p> <p>Minor dust and particulate matter could be generated by RRM activities, but would not have a substantial impact at the watershed scale.</p>	<p>Proposed Action: Approve RRM Program from Jurisdictions in Washington State.</p> <p>RRM plans would meet properly functioning conditions required for RRM Limit 10(ii) approvals, which could minimize the suspension of dust and particulate matter. Similar to the No Action Alternative, there would be no adverse or beneficial effect on air quality at the watershed scale.</p>	<p>Approve Program Comparable to the Oregon Department of Transportation's RRM Program</p> <p>RRM plans meet properly functioning conditions required for RRM Limit 10(i) approvals which will minimize the suspension of dust and particulate matter.</p>	<p>Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures</p> <p>Same as Proposed Action.</p>
WATER QUANTITY	<p>Water quantity would remain unchanged by RRM activities conducted under existing laws because new roads would not be developed.</p>	<p>RRM plans would meet properly functioning conditions required for RRM Limit 10(ii) approvals, which could result in very minor adverse or beneficial effects in the immediate vicinity of roads depending on the local land use and soil conditions.</p>	<p>RRM plans meet properly functioning conditions required for RRM Limit 10(i) approvals.</p>	<p>Same as the Proposed Action</p>

1

2
3

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<p>WATER QUALITY</p>	<p>No Action.</p>	<p>Proposed Action: Approve RRM Program from Jurisdictions in Washington State.</p>	<p>Approve Program Comparable to the Oregon Department of Transportation's RRM Program</p>	<p>Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures</p>
<p>RRM activities would continue with existing practices; if any, for erosion control and water quality measures. Urban areas with populations of 100,000 or more would continue to implement best management practices consistent with the Clean Water Act. Rural areas may or may not implement water quality regulations.</p>	<p>RRM plans would meet properly functioning conditions required for RRM Limit 10(ii) approvals, which would contribute to improved water quality conditions in rural areas where measures are not currently implemented than in urban areas with populations of 100,000 or more.</p>	<p>RRM plans would meet or exceed ODOT Guide for RRM Limit 10(i) approvals.</p>	<p>Same as the Proposed Action.</p>	<p>Same as Proposed Action over the long term. Short term benefits would be realized at the reach scale where mitigation would be provided.</p>
<p>FISH</p>	<p>Trends in status of fish health, abundance, and habitat conditions would continue resulting in continued negative impacts on native fish, threatened ESUs, and other threatened and endangered fish species.</p>	<p>RRM plans would meet properly functioning conditions required for RRM Limit 10(ii) approvals, which would contribute to improved habitat conditions by providing a basis for salmonid recovery and support increased populations of unlisted fish.</p>	<p>Same as the Proposed Action. RRM plans would meet or exceed ODOT Guide for RRM Limit 10(i) approvals, which would contribute to improved habitat conditions.</p>	<p>Same as Proposed Action over the long term. Short term benefits would be realized at the reach scale where mitigation would be provided.</p>

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<p>AQUATIC HABITAT</p>	<p>No Action.</p> <p>Minor aquatic habitat impacts could occur due to RRM activities, but would not have a substantial impact at the watershed scale. Any adverse effects from RRM activities on aquatic habitat would continue at the reach scale.</p>	<p><i>Proposed Action: Approve RRM Programs from Jurisdictions in Washington State.</i></p> <p>RRM plans would meet properly functioning conditions required for RRM Limit 10(ii) approvals, which would have no adverse effects and some beneficial effects compared to the No Action Alternative if plans include measures beyond current laws. There would be no adverse or beneficial effect on aquatic habitat at the watershed scale.</p>	<p><i>Approve Program Comparable to the Oregon Department of Transportation's RRM Program</i></p> <p>Same as the Proposed Action. RRM plans would meet or exceed ODOT Guide for RRM Limit 10(i) approvals.</p>	<p><i>Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures</i></p> <p>Same as Proposed Action over the long term. Short term benefits would be realized at the reach scale where mitigation would be provided.</p>
<p>WILDLIFE</p>	<p>No additional adverse effects at the watershed scale than currently exist since maintenance practices would remain unchanged.</p>	<p>RRM plans would meet properly functioning conditions required for RRM Limit 10(ii) approvals, which could improve habitat conditions. No adverse effects and some beneficial effects compared to the No Action Alternative.</p>	<p>Same as the Proposed Action. RRM plans would meet or exceed ODOT Guide for RRM Limit 10(i) approvals, which would contribute to improved habitat conditions.</p>	<p>Same as Proposed Action over the long term. Short term benefits would be realized at the reach scale where mitigation would be provided.</p>

1
2

3

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	<p>No Action.</p>	<p><i>Proposed Action: Approve RRM Program from Jurisdictions in Washington State.</i></p>	<p><i>Approve Program Comparable to the Oregon Department of Transportation's RRM Program.</i></p>	<p><i>Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures</i></p>
<p>VEGETATION</p>	<p>Minor vegetation impacts could occur due to RRM activities, but would not have a substantial impact at the watershed scale.</p>	<p>RRM plans would meet properly functioning conditions required for RRM Limit 10(ii) approvals, which could improve vegetation and habitat conditions. No adverse effects and some beneficial effects compared to the No Action Alternative if plans include measures beyond current laws.</p>	<p>Same as the Proposed Action. RRM plans meet or exceed ODOT Guide for RRM Limit 10(i) approvals.</p>	<p>Same as Proposed Action over the long term. Short term benefits would be realized at the reach scale where mitigation would be provided.</p>
<p>FEDERAL TREATY AND TRUST RESPONSIBILITIES</p>	<p>None of the alternatives would adversely affect treaty Indian fishing rights or trust responsibilities by decreasing protections to listed species.</p>	<p>Same as No Action, and to the extent these RRM activities improve fish habitat and passage, treaty fishing rights and interests would be positively affected.</p>	<p>Same as the No Action, and to the extent these RRM activities improve fish habitat and passage, treaty fishing rights and interests would be positively affected.</p>	<p>Same as No Action, and to the extent these RRM activities improve fish habitat and passage, treaty fishing rights and interests would be positively affected.</p>

1

2
3
4

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<p>ENVIRONMENTAL JUSTICE</p>	<p>No Action.</p>	<p><i>Proposed Action: Approve RRM Program from Jurisdictions in Washington State.</i></p>	<p><i>Approve Program Comparable to the Oregon Department of Transportation's RRM Program</i></p>	<p><i>Approve the RRM Program from Jurisdictions in Washington State but with Targeted Mitigation Measures</i></p>
	<p>Decline of the 10 ESUs would likely continue, which may have a negative effect on environmental justice. Any adverse effects from RRM activities would continue unless there are section 7 modifications, section 10 habitat conservation plans, or laws aimed at fish and wildlife protection or conservation affecting an ESU.</p>	<p>RRM plans would meet properly functioning conditions required for RRM Limit 10(ii) approvals, which could improve water quality and habitat conditions, thereby protecting and conserving the 10 ESUs. This action may benefit ESUs and thus have a potential beneficial effect on environmental justice over the long term.</p>	<p>Same as the Proposed Action. RRM plans would meet or exceed ODOT Guide for RRM Limit 10(i) approvals.</p>	<p>Same as Proposed Action over the long term. Short term benefits would be realized at the reach scale where mitigation would be provided.</p>

1
2

3

4.2.2 Alternative 2 - Proposed Action - Approve Routine Road Maintenance Program from Jurisdictions in Washington State

Similar to the No Action Alternative, the Proposed Action would have no adverse effect on soils at the watershed scale. At the reach scale, this alternative would reduce or minimize the movement of soils across the landscape and into streams and wetlands by including best management practices aimed at enhancing and protecting salmonid habitat. Under the Proposed Action, the RRM Program contains best management practices which incorporate measures that minimize the movement of soil into a broad array of activities. For example, access road maintenance, ditch excavation, gravel roadway grading, snow and ice control, dust abatement, and mechanical vegetation management are designed to minimize soil movement. The RRM Program also requires substantial staff training, program implementation, sharing of information through the Regional Forum, monitoring, adaptive management, and reporting to NOAA Fisheries that are expected to contribute to the attainment and maintenance of properly functioning habitat condition. Consequently, at the reach scale, implementation of this alternative could result in reduced, minimized, or avoided movement of soils resulting from a variety of management practices conducted adjacent to or above a stream compared to the practices under the No Action Alternative. The proposed best management practices and training, monitoring, and reporting requirements, within the RRM Program would have a beneficial effect on soils at the reach scale as compared to the No Action Alternative where activities may be conducted without implementing best management practices unless other erosion control measures are required by existing Federal, state, county, or local laws or regulations.

4.2.3 Alternative 3 - Approve Program Comparable to the Oregon Department of Transportation's Routine Road Maintenance Program

Similar to the No Action Alternative, Alternative 3 would have no adverse effect on soils at the watershed scale. At the reach scale, erosion control activities that would be part of the best management practices of a proposed RRM Program would avoid or minimize the movement of soils across the landscape and into streams and wetlands. As under Alternative 2, the jurisdiction would be required to implement best management practices that meet or exceed the practices implemented by ODOT under Alternative 3. ODOT best management practices have incorporated measures that minimize the movement of soil into a broad array of activities. For example, road shoulder blading and winter sanding activities have measures designed to minimize soil movement. The jurisdiction would also demonstrate adequate staff training, tracking and reporting to NOAA Fisheries that results in protections equal to or better than those established in the ODOT program as under Alternative 2. Jurisdictions that adopt these best management practices could have a beneficial effect on soils at the reach scale as compared to the No Action Alternative, which could be implemented without best management practices or

1 adequate erosion control measures.

2
3 Under Alternative 3, the impacts to soils would be similar to the Proposed Action. Although the
4 best management practices would be different under the Proposed Action and Alternative 3, the
5 effects to soils at the reach scale and the watershed scale would be similar (Table 2).

6 7 8 **4.2.4 Alternative 4 - Approve the Routine Road Maintenance Program from Jurisdictions** 9 **in Washington State but with Targeted Mitigation Measures**

10
11 RRM activities implemented under Alternative 4 would result in very minor effects on soil
12 conditions as compared to the No Action Alternative. Under Alternative 4, the long-term effects
13 on soil conditions would be similar to the Proposed Action, however the targeted mitigation
14 measures would provide near-term biological function to address any short-term hydrologic
15 impacts from RRM practices as implemented under the Proposed Action. Therefore, at the reach
16 scale, implementing Alternative 4 could result in reduced, minimized, or avoided movement of
17 soils resulting from a variety of RRM practices conducted adjacent to or above a stream
18 compared to the practices under the No Action Alternative.

19
20 Both Alternative 4 and the Proposed Action include best management practices developed to
21 meet specified near-term and long-term conservation outcomes that would be implemented to
22 address the effects of each of these activities on soils. For example, the use of heavy equipment
23 that might compact soil under the No Action Alternative would be unlikely to occur, avoiding
24 changes in soil density and resultant environmental changes. Soil movement from roads
25 maintained near streams or riparian areas would be less likely to occur as compared to the No
26 Action Alternative. Reduced soil movement at the reach scale would result in decreased impacts
27 to localized water quality and aquatic habitat for macroinvertebrates and fish. Mitigation
28 measures would be selected to address site conditions and could include land acquisition, use of
29 specialized erosion control measures beyond those required under the Proposed Action, and
30 floodplain restoration to reduce soil movement into receiving streams. In summary, Alternative
31 4 would include erosion control measures and targeted mitigation activities aimed at
32 conservation outcomes specific to meeting the ecological needs of salmonid ESUs listed as
33 threatened under the ESA, which would not occur under the No Action Alternative.
34 Furthermore, it is expected that soil resource conditions at the reach and watershed scales would
35 be similar under the Proposed Action and Alternative 4 in the long term.

4.3 Air Quality

4.3.1 Alternative 1 - No Action

It is assumed that RRM activities would continue with existing practices for dust abatement and road sweeping. However, the speed of the sweepers would not be controlled to minimize airborne particulates or to remove the maximum amount of debris under the No Action Alternative. Consequently, at the reach scale, implementation of this alternative could result in dust and particulate matter being suspended in the air due to a variety of maintenance practices and may cause localized air quality effects (Regional Road Maintenance Technical Working Group 2002). RRM programs would not impact air quality on a watershed scale because RRM activities would not add particulate matter or dust to the air such that it would be a substantial source at a watershed scale (subsection 3.3, Air Quality).

4.3.2 Alternative 2 - Proposed Action - Approve Routine Road Maintenance Program from Jurisdictions in Washington State

Similar to the No Action Alternative, the Proposed Action would have no adverse effect on air quality at the watershed scale. At the reach scale, this alternative would minimize the suspension of dust and particulate matter, and therefore the amount of airborne particles, through the implementation of erosion and sediment control best management practices for street sweeping, dust abatement, and re-vegetating disturbed areas and exposed soils. (These changes would be more pronounced in eastern Washington, where conditions are drier than in western Washington.) The RRM Program would also require substantial staff training, sharing of information through the Regional Forum, monitoring, program implementation, adaptive management, and reporting to NOAA Fisheries to ensure that best management practices would not add particulate matter or dust to the air such that it would be a substantial source at the reach or watershed scale (subsection 3.3, Affected Environment, Air Quality).

4.3.3 Alternative 3 - Approve Program Comparable to the Oregon Department of Transportation's Routine Road Maintenance Program

Similar to the No Action Alternative, activities under Alternative 3 would have no adverse or beneficial effects on air quality in the analysis area. Activities and best management practices would not be designed to address air quality issues, however, activities would not add particulate matter or dust to the air such that it would be a substantial source at the reach or watershed scale (subsection 3.3, Affected Environment, Air Quality).

4.3.4 Alternative 4 - Approve the Routine Road Maintenance Program from Jurisdictions in Washington State but with Targeted Mitigation Measures

Potential air quality effects would be the same as those under the Proposed Action. The RRM Program would require best management practices to control dust as part of a concerted effort to minimize the likelihood and extent of air- and waterborne particles. These would include measures for dust abatement and road sweeping. As a result, Alternative 4 would reduce the effects of airborne particles compared to the No Action Alternative. Consequently, at the reach scale, implementation of this alternative would result in reduced, minimized, or avoided airborne suspension of dust and particulate matter reducing the effects of a variety of maintenance practices as compared to the No Action Alternative (Regional Road Maintenance Technical Working Group 2002).

4.4 Water Quantity

4.4.1 Alternative 1 - No Action

Previously constructed roadways contribute to the adverse impact human activities have on water quantity (NOAA Fisheries 2002). The jurisdictions responsible for RRM activities would continue their activities in accordance with their current standards of practice and required regulations under the No Action Alternative. Existing RRM activities that may effect peak and base flows in streams include long-term and permanent removal of vegetation, earth clearing work, and hydraulic modification activities such as culvert cleaning, channelizing or diking, culvert replacement, and placement of a temporary instream structures (Regional Road Maintenance Technical Working Group 2002). Current RRM activities that effect water quantity would likely continue unchanged under the No Action Alternative, resulting in a continuation of existing hydrologic patterns unless there are other section 7 modifications, section 10 habitat conservation plans affecting the ESU, or implementation of new laws affecting water quantity are implemented. Therefore, the No Action Alternative would have no adverse or beneficial effect on water quantity at the watershed or reach scale because these activities would not substantially alter hydrologic patterns such that it would change hydrology at either scale (subsection 3.4, Water Quantity).

4.4.2 Alternative 2 - Proposed Action - Approve the Routine Road Maintenance Program from Jurisdictions in Washington State

Compared to the No Action Alternative, the Proposed Action would result in very minor effects on water quantity. The volume and peak flow of runoff from an unmaintained road is essentially the same as the volume and peak runoff from a maintained road. Thus, there would be no

1 substantial change in peak flow or volume of storm water runoff under the Proposed Action. The
2 RRM Program also requires substantial staff training, sharing of information through the
3 Regional Forum, monitoring, program implementation, adaptive management, and reporting to
4 NOAA Fisheries are expected to contribute to the attainment and maintenance of properly
5 functioning habitat condition.

6
7 Culvert, ditch and detention system cleaning practices would change under the Proposed Action
8 compared to the No Action Alternative, and such changes could have a minor effect on the
9 hydrology and hydraulics of the drainage system in the immediate vicinity of the road. In
10 general, culvert placement has a temporary detrimental effect on hydrologic systems. Changed
11 culvert, ditch, and detention system cleaning practices could have minor temporary to long-term
12 adverse effects, or beneficial effects on water quantity, if culverts are properly sized and
13 designed. Any action that causes the hydrology of a road drainage system to more closely mimic
14 the pre-development condition is beneficial, and any action that causes the hydrology to deviate
15 even more from the pre-development condition would be adverse. The goals of the best
16 management practices in the Proposed Action are to minimize the potential loss of instream
17 habitat structure by controlling the timing and scale of ditch cleaning activities. In summary, the
18 Proposed Action Alternative could have very minor adverse or beneficial effects on water
19 quantity in the immediate vicinity of a road depending on the local land uses and soil
20 characteristics.

22 23 **4.4.3 Alternative 3 - Approve Program Comparable to the Oregon Department of** 24 **Transportation's Routine Road Maintenance Program**

25
26 RRM activities implemented under Alternative 3 would result in very minor effects on water
27 quantity as compared to the No Action Alternative. Under Alternative 3, the effects on water
28 quantity would be similar to the Proposed Action. Both alternatives include best management
29 practices that address activities such as ditch and culvert cleaning. Although the best
30 management practices differ, both have the potential to positively affect water quantity at the
31 reach scale, and to improve conditions over the No Action Alternative.

32 33 34 **4.4.4 Alternative 4 - Approve the Routine Road Maintenance Program from Jurisdictions** 35 **in Washington State but with Targeted Mitigation Measures**

36
37 RRM activities implemented under Alternative 4 would result in very minor effects on water
38 quantity as compared to the No Action Alternative. Under Alternative 4, the long-term effects on
39 water quantity would be similar to the Proposed Action, however the targeted mitigation
40 measures would provide near-term biological function to address any short-term hydrologic
41 impacts from RRM practices as implemented under the Proposed Action. Mitigation measures

1 would be selected to address site conditions and could include land acquisition, reduction of
2 impervious surface, and water conservation measures. Both Alternative 4 and the Proposed
3 Action include best management practices that address activities such as ditch and culvert
4 cleaning, and the results would be the same over the long-term. Although the best management
5 practices differ, both have the potential to effect water quantity and hydrology at the reach scale,
6 although these effects would be less with mitigation measures under Alternative 4 in the near
7 term. In summary, Alternative 4 could have very minor adverse or beneficial effects on water
8 quantity in the immediate vicinity of a road depending on the local land uses and soil
9 characteristics as compared to the No Action Alternative. It is expected, however, that water
10 quantity conditions at the reach and watershed scales would be similar under the Proposed
11 Action and Alternative 4 in the long term.
12
13

14 4.5 Water Quality

15 4.5.1 Alternative 1 - No Action

16 The No Action Alternative would have no adverse or beneficial effect on water quality at the
17 watershed or reach scale because it would not involve any change in existing RRM practices, and
18 activities would not alter existing trends in water quality (subsection 3.5, Water Quality). The
19 RRM activities that occur today would likely continue under the No Action Alternative. Thus
20 any adverse effects of road maintenance activities on water quality in the analysis area would
21 likely continue unless other section 7 modifications, section 10 habitat conservation plans
22 affecting the ESU, or implementation of new laws affecting water quality are implemented.
23 Runoff of pollutants from roadways, cleaning ditches, drilling, excavating, filling, grading,
24 grubbing, cleaning, grinding, or cutting in or adjacent to watercourses or streams while carrying
25 out road maintenance activities have the potential to impact water quality (Regional Road
26 Maintenance Technical Working Group 2002).
27
28
29

30 The Biological Review (Regional Road Maintenance Technical Working Group 2002) identifies
31 the activities necessary to maintain roadside ditches, culverts, catch basins, inlets, and
32 detention/retention basins that may effect water quality. These activities function to keep the
33 roadway free from excess water, which can create unsafe conditions or road failures. Activities
34 under the No Action Alternative that may effect water temperature include earth and surface
35 work (clearing, drilling, excavation, filling, grading); short-term removal of vegetation; culvert
36 replacement; paving, shoreline stabilization; and placement of temporary structures (Regional
37 Road Maintenance Technical Working Group 2002). Other activities that may result in the
38 contamination of water quality include paving and the addition of impervious surfaces; painting;
39 structural work; high pressure washing; and the presence of industrial fluids, uncured concrete,
40 hot asphalt, and tar.
41

1 Dust from local RRM activities can settle onto streams and water bodies, contributing to
2 declining water quality and impacting instream habitat for macroinvertebrates and fish.
3 Additionally, use of gas or diesel-powered RRM equipment creates a potential for accidental
4 spills of toxic substances that can kill or injure fish. Under the No Action Alternative, pollutants
5 from vehicles would continue to accumulate on roadways and surrounding rights-of-way until
6 washed from roadways into receiving waterbodies and streams when it rains or snows.
7

8 In urban areas with a population of 100,000 or more, seven jurisdictions responsible for RRM
9 activities are currently implementing best management practices designed to lessen the adverse
10 effects of road maintenance on water quality in accordance with the Clean Water Act
11 requirements (subsection 3.5.1, Water Quality Regulations). Stormwater, however, would
12 remain the common pathway for pollutant delivery to streams. Under the No Action Alternative,
13 the runoff of pollutants from road maintenance activities that is occurring today would likely
14 continue, and the statewide trends in water quality would also continue.
15

16
17 **4.5.2 Alternative 2 - Proposed Action - Approve Routine Road Maintenance Program**
18 **Submittal from Jurisdictions in Washington State**
19

20 In contrast to the No Action Alternative, the Proposed Action would likely have a beneficial
21 effect on water quality because jurisdictions responsible for road maintenance would implement
22 practices that are more protective of water quality than current practices. Under the Proposed
23 Action, the RRM Program includes best management practices for maintaining roadsides,
24 stormwater systems, and road shoulders, mechanical vegetation management, and accident clean
25 up measures. The RRM Program also requires substantial staff training, sharing of information
26 through the Regional Forum, monitoring, program implementation, adaptive management, and
27 reporting to NOAA Fisheries are expected to contribute to the attainment and maintenance of
28 properly functioning habitat condition.
29

30 The beneficial effects of the Proposed Action would be more evident in rural areas than in large
31 urban areas. As described in subsection 3.5.1, Water Quality Regulations, seven jurisdictions
32 responsible for road maintenance in six large urban areas with a population of 100,000 or more
33 are currently implementing some of the best management practices to lessen adverse effects of
34 road maintenance on water quality in accordance with the terms of their National Pollutant
35 Discharge Elimination System storm water permit. Maintenance plans prepared for these seven
36 areas pursuant to Limit 10 are not likely to contain many best management practices that are not
37 already being implemented. Thus, the beneficial effects under the Proposed Action on water
38 quality in the seven urban areas with a population of 100,000 or more are likely to be minor,
39 which is the same effect expected under the No Action Alternative.
40

41 As under the No Action Alternative, National Pollution Discharge Elimination System storm

1 water permits are not required in rural areas or urban areas with a population of less than
2 100,000, or sites with less than five acres of soil disturbance (subsection 3.5.1, Water Quality
3 Regulations). Agencies responsible for road maintenance in these areas are not required to
4 implement best management practices designed to lessen the adverse effects of stormwater runoff
5 on water quality, and most do not.

6
7 In rural areas or urban areas with a population of less than 100,000, the Proposed Action would
8 implement plans designed to lessen the adverse effects of stormwater runoff from RRM activities
9 on water quality where none exist today. Implementation of best management practices in these
10 areas would likely reduce the runoff of worksite pollutants during road maintenance activities
11 and thus, maintain or improve water quality relative to the current condition, which would
12 prevail under the No Action Alternative.

13 14 15 **4.5.3 Alternative 3 - Approve Program Comparable to the Oregon Department of** 16 **Transportation's Routine Road Maintenance Program**

17
18 Under Alternative 3, a jurisdiction with a plan that is equivalent or better than ODOT's program
19 would be required to meet or exceed the best management practices established by ODOT that
20 address water quality issues. This would include best management practices for activities such as
21 maintaining roadsides, stormwater systems, road shoulder maintenance, mechanical vegetation
22 management, and accident clean-up measures. The plans would also require adequate staff
23 training, tracking, and reporting to NOAA Fisheries to assure protection of water quality
24 equivalent to or better than those provided by the ODOT program.

25
26 Under Alternative 3, the effects on water quality would be similar to the Proposed Action. Both
27 alternatives include best management practices that address worksite pollutants, erosion control,
28 and other activities that have the potential to benefit water quality. Although the best
29 management practices would differ, both have the potential to affect water quality at the reach
30 scale, and to improve conditions over the No Action Alternative.

31 32 33 **4.5.4 Alternative 4 - Approve the Routine Road Maintenance Program from Jurisdictions** 34 **in Washington State but with Targeted Mitigation Measures**

35
36 The effects of practices under Alternative 4 would be the same as those under the Proposed
37 Action. In contrast to the No Action Alternative, Alternative 4 would likely have a beneficial
38 effect on water quality because jurisdictions responsible for road maintenance would implement
39 practices that are more protective of water quality than current practices. Similar to the
40 Proposed Action, under Alternative 4, the RRM program would include best management
41 practices for maintaining roadsides, stormwater systems, and road shoulders, mechanical

1 vegetation management, and accident clean up measures. Unlike the Proposed Action,
2 Alternative 4 includes the use of targeted mitigation measures to provide biological function.
3 These mitigation measures could include land acquisition, reducing impervious surfaces,
4 improving floodplain and stream channel connectivity, restoring wetland functions, and using
5 enhanced urban and agricultural stormwater management practices. As under the Proposed
6 Action, the RRM program under Alternative 4 would also require staff training, sharing of
7 information through the regional forum, monitoring, adaptive management, and reporting to
8 NOAA Fisheries to protect water quality. Although the best management practices would differ,
9 Alternative 4 and the Proposed Action have the potential to affect water quality at the reach
10 scale, and to improve conditions over the No Action Alternative. It is expected, however, that
11 water quality conditions at the reach and watershed scales would be similar under the Proposed
12 Action and Alternative 4 in the long term.

13 14 15 **4.6 Fish**

16 17 **4.6.1 Native Fish Species; Salmonid ESUs in the July 2000 4(d) Rule; and Threatened and** 18 **Endangered Fish Species**

19 20 **4.6.1.1 Alternative 1 - No Action**

21 Under the No Action Alternative, trends in the status of fish health, abundance, and habitat
22 conditions in the analysis area would continue, although state and local conservation efforts
23 outside of the ESA could affect these trends. Examples of these efforts in the analysis area
24 include development of Water Resource Inventory Analysis plans, Department of Ecology's
25 Clean Water Act erosion and stormwater control standards, and locally implemented watershed
26 restoration activities.
27

28
29 It is assumed that RRM carried out by the Washington State Department of Transportation, local
30 counties, cities, ports in the analysis area would continue with existing practices. Many RRM
31 activities can negatively impact native fish and their habitats. These activities include ground
32 disturbing activities that generate sediment (clearing ditches, culverts, drainage systems, grading
33 shoulders, and culvert replacement) and side casting of soil and other material. Lack of sufficient
34 erosion control measures can leave exposed soil susceptible to the erosive forces of rainfall and
35 flowing water (Regional Road Maintenance Technical Working Group 2002). Removal of
36 vegetation without adequate replanting, or lack of riparian vegetation protection measures result
37 in elevated water temperatures, reduced concentrations of dissolved oxygen (subsection 3.5.4,
38 Dissolved Oxygen), and increased erosion control problems (subsection 3.5.3, Sediment and
39 Turbidity). Excess sediment loading into receiving waterbodies and streams, together with
40 increased turbidity levels can impair gills of fish, smother eggs, embed spawning gravels, disrupt
41 feeding and growth patterns of juveniles, delay upstream migration of adults, and scour nutrients

1 from the stream substrate (Regional Road Maintenance Technical Working Group 2002).

2
3 Maintenance activities near streams can disturb fish and cause them to temporarily abandon
4 suitable habitat. Disturbance can result from the presence of equipment and personnel in and
5 near streams, placement of temporary structures, or from the use of artificial light during night
6 work (Regional Road Maintenance Technical Working Group 2002). Maintenance activities
7 may also result in accidental spills of toxic substances, and the long-term or permanent removal
8 of riparian vegetation can degrade water quality (subsection 3.5.2, Temperature).

9
10 Under the No Action Alternative, Federal agencies, and those entities that accept Federal funds
11 or apply for a Federal permit, would continue to consult with NOAA Fisheries before taking any
12 action that may affect the 14 salmonid ESUs as required under section 7 of the ESA. However, it
13 is anticipated that the majority of road maintenance actions would not fall under the purview of
14 section 7. Therefore, implementation of the No Action Alternative may result in continued
15 current effects on native fish, threatened ESUs in the July 2000 4(d) rule, and other threatened
16 and endangered species from RRM activities. Over time, however, continued gradual
17 improvements to fish and their habitats may be evident as a result of other section 7 consultations
18 affecting the ESUs, and other Federal, state, and local regulations and practices aimed at fish
19 habitat protection or conservation that enhance ESU conditions. In addition, programs currently
20 implemented to protect listed species would continue to provide slight benefits to cold-water
21 species such as coastal cutthroat, and ancillary benefits to listed warm-water or unique species
22 (subsection 3.6.1, Fish) because of improved habitat conditions.

23 24 25 **4.6.1.2 Alternative 2 - Proposed Action - Approve Routine Road Maintenance** 26 **Program from Jurisdictions in Washington State**

27
28 The Proposed Action may affect human activities leading to habitat degradation. The analyses
29 described below focus on the probable effects of the Proposed Action viewed in isolation from
30 the many other factors that affect the 10 salmonid ESUs. The environmental impacts of Limit
31 10(ii), together with all other past and present, and reasonably predictable future actions that
32 affect the 10 salmonid ESUs, are described in Section 5.0, Cumulative Impacts.

33
34 Under the Proposed Action, the RRM Program contains a variety of best management practices,
35 including the use of mechanical treatments reducing the use of chemical treatments along
36 roadsides, more efficient ditch maintenance, protection of riparian habitat, dust abatement, snow
37 and ice control, maintaining stormwater systems, fish exclusion measures, erosion control
38 measures, mechanical vegetation management, and accident clean up measures. These best
39 management practices, in conjunction with substantial training, sharing of information in the
40 Regional Forum, monitoring, adaptive management, and reporting requirements, are expected to
41 contribute to the attainment and maintenance of properly functioning habitat condition.

1 Furthermore, NOAA Fisheries would not provide ESA liability protections for use of pesticides
2 or herbicides.

3
4 Although implementation of the RRM Program alone is not likely to lead to recovery of the 10
5 salmonid ESUs, it would contribute to improved habitat conditions, which would provide a
6 foundation for salmonid recovery and would support increased populations of unlisted fish.

7
8 The RRM Program would comply with the Clean Water Act and various state and local
9 regulations that may require erosion control, removal of non-native plants and replacement with
10 native species, and riparian vegetation protection ordinances. Thus, any possible incremental
11 benefits of the Proposed Action on the 10 salmonid ESUs and other fish, as compared to the No
12 Action Alternative, would occur over the long-term, showing slow incremental improvements in
13 habitat.

14
15 The 10 salmonid ESUs are in decline. The decline has been attributed to many different factors,
16 including harvest, operation of hatcheries, hydropower development, and destruction of habitat
17 (Federal Caucus 2000). Additionally, municipal and agricultural water withdrawals cause water
18 shortages throughout the West, creating passage barriers, water quality declines, and eliminating
19 habitat. Though less measurable, the effects of introduced aquatic nuisance species, which
20 compete for habitat and prey on salmon, have caused a decline in salmon populations (He and
21 Kitchell 1990). Recent research has shown that ocean conditions play a profound role in survival
22 to spawning age, and contribute substantially to total salmon population numbers (Beamish et al.
23 2000). However, the relative importance of the injurious activities is not known within the 10
24 ESUs.

25
26 The most prominent of the threatened and endangered fish species are the salmon and steelhead.
27 Many other fish species are listed under the ESA and state sensitive species programs, including
28 species under the jurisdiction of the U.S. Fish and Wildlife Service and state departments of fish
29 and wildlife. These species represent a wide range of taxa, from the widespread coastal cutthroat
30 and bull trout, to endemic species occupying highly unique habitats.

31
32 The Proposed Action would result in improved habitat conditions for listed fish species,
33 particularly salmonids and other cold-water species. Warm-water listed species could also
34 benefit somewhat from the implementation of the RRM Program, as well as from other state and
35 local programs that protect habitat and water quality because these factors are essential to the
36 survival of these species. Programs currently implemented to protect the 10 listed ESUs would
37 continue to provide benefits, which when combined with RRM programs under this alternative
38 would provide greater benefits to special status cold-water species than conditions under the No
39 Action Alternative. For example, increased protections to riparian habitat and improved erosion
40 control as compared to existing practices would benefit both warm and cold-water listed species.
41 Overall, listed and unlisted fish species could benefit from activities under the Proposed Action

1 as compared to the No Action Alternative where no protection measures are likely to be
2 implemented.

3
4
5 **4.6.1.3 Alternative 3 - Approve Program Comparable to the Oregon Department of**
6 **Transportation's Routine Road Maintenance Program**

7
8 Under Alternative 3, a jurisdiction would be required to implement a program that contains best
9 management practices that are equivalent or better than the practices in the ODOT program.
10 Similar to the Proposed Action, this would include best management practices for activities such
11 as dust abatement, winter sanding, maintaining storm water systems, erosion control measures,
12 mechanical vegetation management, and accident clean-up measures (Table 2). A program under
13 Alternative 3 would also require adequate staff training, tracking, and reporting to NOAA
14 Fisheries that results in protections equivalent to or better than those provided by the ODOT
15 program. Furthermore, NOAA Fisheries would not provide ESA liability protections for the use
16 of pesticides or herbicides, even if in accord with the ODOT guidance.

17
18 As under the Proposed Action, a jurisdiction would develop a program to maintain roadways
19 using methods that would benefit salmon under Alternative 3. Although the best management
20 practices developed under the Proposed Action and Alternative 3 would be different (Table 2),
21 the effects to salmonids would be very similar.

22
23 Under Alternative 3, habitat conditions affected by RRM plans would improve as compared to
24 conditions under the No Action Alternative. The benefits to habitat and listed and unlisted fish
25 species would be similar to the Proposed Action. The implementation of RRM best management
26 practices under Alternative 3, in addition to other state and local best management practices such
27 as fish passage requirements, would incrementally benefit native fish. As water quality continues
28 to improve, native fish may displace invasive warm-water fish species. Non-native cold-water
29 species would benefit from habitat and water quality improvements, but would continue to be
30 managed by local departments of fish and wildlife.

31
32
33 **4.6.1.4 Alternative 4 - Approve the Routine Road Maintenance Program from**
34 **Jurisdictions in Washington State but with Targeted Mitigation Measures**

35
36 Effects under Alternative 4 would be largely the same as under the Proposed Action, and
37 beneficial compared to the No Action Alternative. The primary difference between these
38 Alternative 4 and the Proposed Action would be the occasional use of mitigation under
39 Alternative 4. Mitigation would be available for the few situations under the RRM where road
40 maintenance activities would cause short-term deficits in habitat function, despite the focus of
41 the RRM on conservation directed outcomes. Mitigation measures could include acquiring high

1 quality riparian habitat, reducing impervious surfaces, increasing stream flow, reconnecting
2 floodplains and stream, stabilizing human-induced landslide prone areas to minimize sediment
3 delivery, and placing large wood in stream channels to provide in-stream cover and habitat
4 complexity. The effect of the RRM itself on trends in the status of fish health, abundance, and
5 habitat conditions in the analysis area would be improvement over No Action conditions, to the
6 extent that road maintenance activities affect these trends. Through the addition of occasional
7 mitigation projects, Alternative 4 would generally further attenuate the effect of road
8 maintenance practices on trends in fish health, abundance, and habitat conditions compared to
9 the Proposed Action, although resource conditions are expected to be the same over the long
10 term.

11
12 Unlike practices under the No Action Alternative, RRM activities carried out by the Washington
13 State Department of Transportation, and the cities, counties, and ports that submitted the RRM
14 Program, would be conducted to achieve conservation outcomes specifically protective of fish
15 and fish habitat. RRM activities that can negatively impact native fish and their habitats would be
16 addressed through the strategic use of best management practices. These practices include
17 activities that would reduce, minimize, or avoid the effects of ground disturbing activities that
18 generate sediment (clearing ditches, culverts, drainage systems, grading shoulders, and culvert
19 replacement) and side casting of soil and other material. Erosion control measures would be
20 required where activities might leave exposed soil susceptible to the erosive forces of rainfall and
21 flowing water. Removal of non-native and invasive vegetation would also be required, and
22 vegetation removal would be addressed by replanting native vegetation. These measures would
23 reduce and minimize the effects of lack of riparian vegetation (e.g., elevated water temperatures,
24 reduced concentrations of dissolved oxygen) (subsection 3.5.4, Dissolved Oxygen), and
25 increased erosion control problems (subsection 3.5.3, Sediment and Turbidity). Because
26 Alternative 4 would add the occasional benefit of individual mitigation projects to RRM actions,
27 Alternative 4 would cause incrementally beneficial results compared to the Proposed Action,
28 depending on the time and location of any mitigation projects, although resource conditions are
29 expected to be the same over the long term .

31 32 **4.6.2 Aquatic Habitat**

33 34 **4.6.2.1 Alternative 1 - No Action**

35
36 The No Action Alternative would have no additional effects on aquatic habitat at the watershed
37 scale than currently exists if current land use practices continue. At the reach scale within a
38 watershed, incremental improvement is possible due to implementation of riparian management
39 best management practices in urban areas with populations of 100,000 or more (subsection 3.5.1,
40 Water Quality Regulation) or where other land use planning and watershed restoration efforts
41 require protections of riparian, wetland, and other vegetation. RRM activities would continue as

1 they are currently implemented, resulting in negative impacts on aquatic habitat at the reach
2 scale. Practices that impact habitat would include surface work (clearing, drilling, excavation,
3 filling, grubbing, and cutting); vegetation modification (long-term and permanent removal of
4 vegetation); shoreline stabilization work; and addition or expansion of impervious surfaces
5 (Regional Road Maintenance Technical Working Group 2002). Overall, the No Action
6 Alternative would have no adverse or beneficial effect on aquatic habitat at a watershed scale
7 because it does not include any change in existing land use trends or existing RRM practices, and
8 therefore continuation of existing RRM activities would not substantially impact continuing
9 aquatic habitat trends and patterns at the watershed scale.

10 11 12 **4.6.2.2 Alternative 2 - Proposed Action - Approve Regional Routine Road** 13 **Maintenance Program from Jurisdictions in Washington State**

14
15 This alternative would have no adverse effect on aquatic habitat in the analysis area compared to
16 the No Action Alternative. Under the Proposed Action, there would be improvement to
17 vegetation conditions compared to the No Action Alternative. The RRM Program contains
18 specific aquatic habitat protection measures and mechanical aquatic habitat management
19 (subsection 3.6.1.4, Aquatic Habitat). The RRM Program also requires substantial staff training,
20 sharing of information through the Regional Forum, monitoring, program implementation,
21 adaptive management, and reporting to NOAA Fisheries to ensure the attainment and
22 maintenance of properly functioning habitat condition.

23
24 Under the best management practices in the RRM Program, aquatic habitat would be managed to
25 minimize impacts to threatened salmonids. Conditions would also improve for riparian
26 vegetation because of less removal of riparian vegetation, more replanting with native species,
27 and therefore less sediment moving through riparian habitat as compared to the No Action
28 Alternative, unless these practices are already required through existing laws and regulations in
29 each jurisdiction.

30 31 32 **4.6.2.3 Alternative 3 - Approve Program Comparable to the Oregon Department of** 33 **Transportation's Routine Road Maintenance Program**

34
35 Only minor in-water activities, such as culvert cleaning, are included under Alternative 3.
36 Consequently, Alternative 3 would have no direct adverse or beneficial effects on aquatic habitat
37 in the analysis area. Indirect beneficial effects may be observed at a reach scale because of local
38 improvements in water quality and riparian habitat. This alternative would have no adverse
39 effect and some indirect beneficial effects on aquatic habitat in the analysis area compared to the
40 No Action Alternative.

1 section 7 consultation. Therefore, these measures may provide some beneficial effects under the
2 No Action Alternative.

3
4
5 **4.7.1.2 Alternative 2 - Proposed Action - Approve Routine Road Maintenance**
6 **Program Submittal from Jurisdictions in Washington State**

7
8 This alternative would have no adverse effect and some beneficial effects on birds, land
9 mammals, and herpetofauna compared to the No Action Alternative. At the reach scale within a
10 watershed, improvement of habitat conditions associated with the RRM Program may be realized
11 for some herpetofauna, small mammals, and neo-tropical birds.

12
13 The RRM Program contains a variety of best management practices, including specific habitat
14 protection measures, mechanical vegetation management, and accident clean up measures. The
15 RRM Program also requires substantial staff training, sharing of information through the Forum,
16 program implementation, monitoring, adaptive management, and reporting to NOAA Fisheries
17 are expected to contribute to the attainment and maintenance of properly functioning habitat
18 condition. The Proposed Action may include the use of mechanical maintenance treatments to
19 reduce chemical treatments, reducing runoff of pollutants associated with roadways, and
20 restoring natural flow regimes along roadsides that could benefit some herpetofauna associated
21 with roadside habitats and could improve the prey base for birds and mammals.

22
23
24 **4.7.1.3 Alternative 3 - Approve Program Comparable to the Oregon Department of**
25 **Transportation's Routine Road Maintenance Program**

26
27 Under Alternative 3, a jurisdiction would be required to develop a plan that meets or exceeds the
28 best management practices established by ODOT, which include specific habitat protection
29 measures, mechanical vegetation management, and accident clean-up measures. Similar to the
30 Proposed Action, these plans would also require adequate staff training, tracking, and reporting
31 to NOAA Fisheries that results in protections equivalent to or better than those provided by the
32 ODOT program. Under Alternative 3, the jurisdiction may include measures such as the
33 mechanical roadside maintenance, to reduce chemical treatments, that could benefit some
34 herpefauna associated with roadside habitats and could improve the prey base for birds and
35 mammals. Although the best management practices developed under the Proposed Action and
36 Alternative 3 would be different (Table 2), the effects to birds, land mammals, and herpefauna
37 would be very similar at the reach and watershed scales.

4.7.1.4 **Alternative 4 - Approve Routine Road Maintenance Program from Jurisdictions in Washington State but with Targeted Mitigation Measures**

The long-term effects of Alternative 4 would be identical to the Proposed Action, although the use of mitigation measures under Alternative 4 would provide immediate benefits to address any near-term impacts of RRM activities as compared to the Proposed Action. Mitigation measures could include acquiring riparian and wetland habitat, reducing impervious surfaces, increasing stream flow, reconnecting floodplains and streams, and placing large wood in stream channels to provide riparian and in-stream habitat complexity. There might be incidental incremental benefits compared to the No Action Alternative to the extent that any eventual mitigation projects also support this resource.

4.7.2 **Threatened and Endangered Wildlife Species**

4.7.2.1 **Alternative 1 - No Action**

The No Action Alternative would have no additional adverse effects at the watershed scale and some potential beneficial effects on listed wildlife species at the watershed scale. At the reach scale, ongoing RRM activities conducted by the Washington State Department of Transportation and other entities has the potential to negatively effect species associated with vegetated edge habitats, such as Nelson's checkermallow, Kincaid's lupine, Fender's blue butterfly, willow flycatcher, and Canada lynx because RRM practices can disturb the habitats upon which these species depend. Overall, however, Washington State and local habitat protection regulations, together with other salmon recovery activities, provide benefits to listed species by protecting riparian and aquatic habitats. Therefore the No Action Alternative would not involve any change in existing practices, and activities would not alter existing wildlife population trends, and in some cases may benefit certain populations.

4.7.2.2 **Alternative 2 - Proposed Action - Approve Routine Road Maintenance Program from Jurisdictions in Washington State**

This alternative would have no adverse effect on listed species compared to the No Action Alternative at the watershed scale. At the reach scale within a watershed, improvement of habitat conditions may be realized for some herpetofauna and neo-tropical birds because of best management practices, including specific measures to protect vegetation and moderate temperature, and mechanical vegetation management as compared to the No Action Alternative (subsection 2.4, Alternatives, Proposed Action). The use of mechanical maintenance treatments, to reduce chemical treatments, along roadsides could benefit some plants and animals associated with roadside habitats, such as ground-dwelling amphibians, and could improve the prey base for

1 some birds and mammals. Activities that reduce the use of chemicals and result in more efficient
2 ditch maintenance and more intact riparian corridors could benefit listed species directly or
3 indirectly. The RRM Program also requires substantial staff training, sharing of information
4 through the Forum, monitoring, program implementation, adaptive management, and reporting to
5 NOAA Fisheries are expected to contribute to the attainment and maintenance of properly
6 functioning habitat conditions.

7 8 9 **4.7.2.3 Alternative 3 - Approve Program Comparable to the Oregon Department of** 10 **Transportation's Routine Road Maintenance Program**

11
12 Under Alternative 3, a jurisdiction would be required to develop a plan that meets or exceeds the
13 best management practices established by ODOT, which include specific vegetation protection
14 measures and mechanical vegetation management. Similar to the Proposed Action, these plans
15 would also require adequate staff training, tracking, and reporting to NOAA Fisheries that results
16 in protections equivalent to or better than those provided by the ODOT program.

17
18 Under Alternative 3, the jurisdiction may include measures such as the mechanical roadside
19 maintenance, to reduce chemical treatments, that could benefit some plants and animals
20 associated with roadside habitat, such as ground-dwelling amphibians, and could improve the
21 prey base for some birds and mammals. Activities that reduce the use of chemicals and result in
22 more efficient ditch maintenance and more intact riparian corridors could benefit listed species
23 directly or indirectly. Although the best management practices developed under the Proposed
24 Action and Alternative 3 would be different (Table 2), the effects to birds, land mammals, and
25 herpefauna would be very similar at the reach and watershed scales.

26 27 28 **4.7.2.4 Alternative 4 - Approve the Routine Road Maintenance Program from** 29 **Jurisdictions in Washington State but with Targeted Mitigation Measures**

30
31 The effects of Alternative 4 would be identical to the Proposed Action and have beneficial effects
32 as compared to the No Action Alternative. The use of mitigation measures under Alternative 4
33 would provide immediate benefits to address any near-term impacts of RRM activities as
34 compared to the Proposed Action, although resource conditions are expected to be the same over
35 the long term. Mitigation measures could include acquiring riparian and wetland habitat,
36 reducing impervious surfaces, increasing stream flow, reconnecting floodplains and streams, and
37 placing large wood in stream channels to provide riparian and in-stream habitat complexity.
38 There might be incidental incremental benefits compared to the No Action Alternative to the
39 extent that any eventual mitigation projects also support threatened and endangered wildlife
40 species.
41

4.8 Vegetation

4.8.1 Alternative 1 - No Action

This alternative would have no additional effects on vegetation at the watershed scale than currently exists if current land use practices continue. RRM activities would continue as they are currently implemented, resulting in negative impacts on vegetation in riparian areas at the reach scale within a watershed. Practices that impact riparian vegetation would include surface work (clearing, drilling, excavation, filling, grubbing, and cutting), vegetation modification (long-term and permanent removal of vegetation); shoreline stabilization work; and addition or expansion of impervious surfaces (Regional Road Maintenance Technical Working Group 2002). In addition to the consequences of RRM practices on riparian vegetation, however, incremental improvement is also possible due to implementation of riparian management best management practices in urban areas with populations of 100,000 or more (subsection 3.5.1, Water Quality Regulations) or where other local and Federal efforts require protections of riparian, wetland, and other vegetation. Overall, the No Action Alternative would have no adverse or beneficial effect on vegetation at a watershed scale because it does not include any change in existing RRM practices or land use patterns.

4.8.2 Alternative 2 - Proposed Action - Approve Routine Road Maintenance Program Submittal from Jurisdictions in Washington State

In contrast to the No Action Alternative, the Proposed Action would likely have a beneficial effect on vegetation conditions because jurisdictions responsible for road maintenance would implement practices that are more protective of vegetation than under current practices. Under the Proposed Action, the RRM Program contains various best management practices, including specific vegetation protection measures and mechanical vegetation management (subsection 2.4, Alternatives, Proposed Action). Vegetation would be managed to minimize impacts to threatened salmonids, and invasive non-native vegetation would be replaced with native plant species. Conditions may also improve for riparian vegetation because of less removal of riparian vegetation, more replanting with native species, and therefore less sediment moving through riparian habitat. The RRM Program also requires substantial staff training, sharing of information through the Regional Forum, monitoring, program implementation, adaptive management, and reporting to NOAA Fisheries are expected to contribute to improved vegetation and habitat conditions at the reach or watershed scale (subsection 3.3, Affected Environment, Air Quality).

1 **4.8.3 Alternative 3 - Approve Program Comparable to the Oregon Department of**
2 **Transportation's Routine Road Maintenance Program**
3

4 Under Alternative 3, a jurisdiction would be required to develop a plan that meets or exceeds the
5 best management practices established by ODOT, which include specific vegetation protection
6 measures and mechanical vegetation management. Similar to the Proposed Action, these plans
7 would also require adequate staff training, tracking, and reporting to NOAA Fisheries that results
8 in protections equivalent to or better than those provided by the ODOT program.
9

10 Under Alternative 3, vegetation would be managed to minimize impacts to threatened salmonids,
11 and invasive non-native vegetation would be replaced with native plant species. Conditions may
12 also improve for riparian vegetation because of less removal of riparian vegetation, more
13 replanting with native species, and therefore less sediment moving through riparian habitat.
14 Some state and/or local guidance support the use of native plants and encourage the development
15 of riparian plant communities. However, the RRM Guide further clarifies the management of
16 vegetation within the jurisdiction's right-of-way. Although the best management practices
17 developed under the Proposed Action and Alternative 3 would be different (Table 2), the effects
18 to vegetation would be very similar at the reach and watershed scales.
19
20

21 **4.8.4 Alternative 4 - Approve the Routine Road Maintenance Program from Jurisdictions**
22 **in Washington State but with Targeted Mitigation Measures**
23

24 Unlike the No Action Alternative and similar to the Proposed Action, Alternative 4 would
25 beneficially effect this resource. Effects would likely be identical to those described under the
26 Proposed Action. The use of mitigation measures under Alternative 4 would provide immediate
27 benefits to address any near-term impacts of RRM activities as compared to the Proposed Action,
28 although resource conditions are expected to be the same over the long term. Mitigation
29 measures could include acquiring riparian and wetland habitat, reducing impervious surfaces,
30 increasing stream flow, reconnecting floodplains and streams, and placing large wood in stream
31 channels to provide riparian and in-stream habitat complexity. Alternative 4 would specifically
32 attenuate the effect of road maintenance practices on habitat functional condition in exactly the
33 same way as the Proposed Action. However, the use of strategically located mitigation projects
34 would add near-term incremental benefits to vegetation affected by the RRM program. Strategic
35 use of mitigation would be intended to address temporary functional deficits caused in the few
36 instances where RRM activities are not addressed by the RRM program's best management
37 practices as compared to the Proposed Action, but resource conditions are expected to be same
38 over the long term.

1 **4.9 Federal Treaty and Trust Responsibilities; Tribal Rights and Interests - All**
2 **Alternatives**

3
4 None of the alternatives under consideration would adversely affect treaty Indian fishing rights
5 by decreasing protections to listed species. To the extent that RRM activities improve fish
6 habitat and fish passage, treaty Indian fishing rights would be positively affected. However, the
7 analysis undertaken for RRM programs is for ESA purposed only, and NOAA Fisheries makes
8 no implied or explicit assurances that the RRM programs satisfy treaty Indian fishing rights. In
9 addition, none of the alternatives involve road building or construction activities that would
10 effect Federal treaty and trust responsibilities or disturb culturally historic lands.
11

12
13 **4.10 Environmental Justice - All Alternatives**

14
15 The No Action Alternative under consideration may have an impact on Environmental Justice
16 described in subsection 3.9, Environmental Justice, because the decline of the 14 salmonids
17 ESUs would likely continue due to a multitude of factors, and therefore, have an effect on the
18 areas where minority or low income populations exist. The Proposed Action, Alternative 3, and
19 Alternative 4 would have no direct or indirect negative impacts on threatened and non-threatened
20 fish species or environmental justice issues, but could have some beneficial impacts because
21 RRM programs would be modified to conserve listed ESUs. Benefits under these Alternatives
22 include improved water quality and habitat conditions, which would also benefit populations and
23 threatened salmonids and native fish species. None of the alternatives involve road building or
24 construction activities that would effect these populations or disturb culturally historic lands.

5.0 CUMULATIVE IMPACTS

1
2
3 This section analyzes the cumulative effects (positive and negative) of the Proposed Action
4 (Alternative 2) in the context of other Federal or non-Federal past, present, and reasonably
5 foreseeable future actions within the analysis area in the State of Washington. NEPA defines
6 cumulative effects as “the impact on the environment which results from the incremental impact
7 of the Action when added to other past, present, and reasonably foreseeable future actions
8 regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40
9 FR 1508.7). For the purposes of this discussion, the terms “effects” and “impacts” are
10 considered to be synonymous with consequences. Cumulative impacts result from Federal or
11 non-Federal past, present, and reasonably foreseeable future actions that, when considered in
12 isolation, have less than significant adverse environmental impacts, but collectively can have
13 significant impacts over time, on the same resource.

14
15 The cumulative impacts analysis covers the analysis area described in Figure 1 and also examines
16 any actions outside the analysis area that are reasonably likely to affect the resources it contains.
17 A number of present or reasonably foreseeable resource management strategies would affect
18 listed ESUs and their habitat within and adjacent to the analysis area. Federal, Tribal, state, and
19 local government actions are likely to be in the form of legislation, administrative rules, or policy
20 initiatives. These actions may include changes to land use patterns and water use allocations,
21 which can affect the intensity and location of these across the analysis area. There are
22 uncertainties related to the implementation of these government actions due to budget and policy
23 constraints, which when taken into account over a wide geographic area, makes this cumulative
24 effects analysis difficult. A general description of the primary Federal, Tribal, state, and local
25 programs is summarized below. The following list of programs is not comprehensive, yet it
26 describes a broad range of programs. Table 17 identifies the ESUs affected by each plan.

27 28 29 **Federal Plans, Policies, and Programs**

30
31 Federal management plans or activities influencing fish or their habitat in the cumulative effects
32 analysis area include implementation of the Clean Water Act, ESA, U.S. Army Corps of
33 Engineers flood control and water storage, environmental improvement projects, and
34 implementation of the federal Northwest Forest Plan.

35
36 Endangered Species Act. The 1973 ESA provides for the conservation of ecosystems upon
37 which threatened and endangered species of fish, wildlife, and plants depend. The ESA, among
38 other things, also: 1) authorizes the determination and listing of species as endangered and
39 threatened; 2) requires the development of a recovery plan for listed species; 3) prohibits
40 unauthorized taking, possession, sale, and transport of endangered and threatened species; and 4)
41 requires federal agencies (including U.S. Fish and Wildlife Service and NOAA Fisheries) to

1 ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the
2 continued existence of a listed species.

3
4 U.S. Corps of Engineers Flood Control and Water Resources Development Act The Flood
5 Control Act of 1936 extended the U. S. Corps of Engineers authority for flood damage reduction
6 to the entire country, to address the solution of flooding problems affecting the public interest
7 that were too large or complex to be handled by state or local governments. Actions that are
8 relevant under this Act for the purposes of this cumulative analysis include construction and
9 maintenance of flood control levees and revetments, and construction and operation of dams used
10 to regulate flood flows. The Water Resources Development Act of 1986 authorized the U.S.
11 Corps of Engineers to propose modifications of its existing projects for environmental
12 improvement.

13
14 Northwest Forest Plan. Implementation of the aquatic conservation strategy under the Federal
15 Northwest Forest Plan in 1994 provided increased protection of aquatic habitat via a combination
16 of riparian reserves designed to buffer streams and to protect unstable areas; designation of key
17 watersheds that currently provide high quality habitat and serve as refugia for at-risk species,
18 watershed analysis to evaluate geomorphic and ecological processes operating at a landscape
19 scale; and a comprehensive program of watershed restoration to restore watershed health,
20 riparian ecosystems, and fish habitats. This conservation strategy continues to serve as the
21 cornerstone for aquatic habitat protection on Federal forestlands.

22
23 Clean Water Act. The Federal Water Pollution Control Act was originally enacted in 1972 and
24 amended with major provisions by legislation in 1977, 1981, and 1987. It is commonly referred
25 to as the Clean Water Act. The principal objective of the Act is to restore and maintain the
26 chemical, physical, and biological integrity of the nation's waters. The Clean Water Act also
27 establishes a national policy on technology-based effluent standards and discharge water quality
28 standards.

29
30 Lower Columbia National Estuary Partnership: The mission of the Lower Columbia River
31 Estuary Partnership is to protect and enhance the lower Colombia River ecosystem. The lower
32 Columbia River and estuary suffer from a variety of human induced problems that have adversely
33 affected the ecosystem. The Estuary Partnership is implementing a variety of initiatives directed
34 at restoring the biological integrity of the river and estuary.

35 36 37 **Tribal Plans, Policies, and Programs**

38
39 Tribal Conservation Measures: A recovery planning group composed of the Makah and Quileute
40 Indian Tribes, the National Park Service, and the Washington State Department of Fish and
41 Wildlife is carrying out a collaborative planning effort to determine how to increase the

1 abundance of naturally spawning Ozette Lake sockeye salmon to historic and self-sustaining
2 population levels. The Makah Tribe has been operating a supplementation program in Ozette
3 Lake since the early 1980s.

4
5 Columbia River Anadromous Fish Restoration Plan: The objectives of the Columbia River
6 Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama
7 Tribes are to halt the decline of salmon, lamprey, and white sturgeon populations above
8 Bonneville Dam. In addition, the plan strives to rebuild salmon populations to annual run sizes
9 of four million above Bonneville Dam within 25 years in a manner that supports tribal
10 ceremonial, subsistence, and commercial harvests.

11
12 Shared Strategy for Salmon Recovery: The Northwest Indian Fisheries Commission is
13 participating in the Shared Strategy, together with NOAA Fisheries, other Federal agencies, state
14 and local governments, and others in an effort to save declining wild salmon stocks in the Puget
15 Sound region. The Shared Strategy would develop a recovery plan in two years that meets the
16 broad interests for salmon in Puget Sound, establish a framework to link recovery efforts,
17 complete a recovery plan, and guide implementation, and identify and support current efforts to
18 protect Puget Sound salmon. Not all Tribes in the Puget Sound Region, however, are
19 participating in this effort.

20 21 22 **State Plans, Policies, and Programs**

23
24 Wild Salmon Policy. The state of Washington established a Joint Natural Resources Cabinet and
25 Salmon Recovery Office in response to the listing of threatened chinook and other species. The
26 Wild Salmonid Policy was developed in cooperation with tribal governments and was adopted in
27 1997. The goal of the Wild Salmonid Policy is to protect, restore, and enhance the productivity,
28 production, and diversity of wild salmonids and their ecosystems to sustain ceremonial,
29 subsistence, commercial, and recreational fisheries (Washington Department of Fish and Wildlife
30 1997).

31
32 Aquatic Use Authorization (Aquatic Lease): Temporary transfer of state owned aquatic lands'
33 (includes harbors, state tidelands, shorelands, and beds of navigable waters) property rights for
34 specified period of time.

35
36 Shoreline Management Act. The state Shorelines Management Act protects and regulates
37 management that could impact shorelines of the state. Shorelines of the state include streams
38 with a mean annual flow of more than 20 cfs and lakes larger than 20 acres. Associated
39 shorelines include lands within 200 feet of the ordinary high water mark and wetlands of river
40 deltas associated with the streams. Activities proposed within shorelines of the state must
41 comply with permitting and development requirements set forth in the Shoreline Master Program

1 and Shoreline Regulations.
2

3 State Environmental Policy Act: The State Environmental Policy Act was enacted in 1971 to
4 provide a framework for agencies to consider the environmental consequences of a proposal
5 before taking action. It also gives agencies the ability to condition or deny a proposal due to
6 identified likely substantial adverse impacts.
7

8 Puget Sound Water Quality Management Plan: The 2003-2005 Puget Sound Water Quality Plan
9 describes the actions that state agencies proposed to take to protect and restore Puget Sound
10 during the 2003-2005 biennium. The Plan includes actions to address salmon and other at risk
11 species, marine and fresh water habitat, contaminated sediments, shellfish protection, stormwater
12 management, on-site sewage systems, aquatic nuisance species, monitoring, and education.
13

14 Growth Management Act. The 1990 Washington Growth Management Act requires all cities
15 and counties to plan for growth, including a transportation plan, while protecting natural
16 resources. All jurisdictions must classify and designate natural resource lands, i.e., agricultural
17 and forestland, and critical areas. These jurisdictions must also adopt regulations such as zoning,
18 subdivision ordinances, and other land use controls to protect the critical areas.
19

20 Washington Forest Practices Rules. The Washington State Department of Natural Resources
implements and enforces the State of Washington's Forest Practice Rules which are promulgated
22 through the Forest Practices Board. The rules are based on adaptive management of forestlands
23 through watershed analysis, development of site-specific land management prescriptions and
24 monitoring.
25

26 Hydraulic Project Approvals: Hydraulic project approvals are permits issued by the Washington
27 Department of Fish and Wildlife to any person, organization, or government agency proposing to
28 conduct activities that change, obstruct, or divert the bed or flow of fresh and salt waters of the
29 state of Washington. An hydraulic project approval is either approved, conditioned, or denied
30 based solely on protection of fish life, which includes all fish and shellfish at all stages of
31 development.
32

33 Watershed Management Act: The 1999 Watershed Management Act established a process for
34 local governments in the state of Washington to conduct watershed planning. This planning
35 would be used to address water quality, water quantity, and salmon habitat issues. The Act
36 provides funding and a planning framework for locally based watershed management.
37

38 Salmon Recovery Planning Act. The 1998 Salmon Recovery Planning Act provides funding and
39 a procedural framework for prioritizing salmon restoration projects within specified areas agreed
40 to by participating county, city, and tribal governments. These restoration efforts would be
41 important components of watershed and regional salmon recovery initiatives.

Local Plans, Policies, and Programs

Lower Columbia Fish Recovery Board was established by the state to begin drafting recovery plans for the lower Columbia River region.

Tri-County ESA Group: In 1998 a Tri-County ESA response effort for Snohomish, King, and Pierce counties was created in response to the Puget Sound Chinook and bull trout listings. The three counties are working together with cities, tribes, the environmental community, utilities, and other community groups to develop a coordinated recovery plan that addresses the needs of densely populated, heavily urbanized, and industrialized areas that are charged with implementing programs to conserve listed species.

Local Ordinances and Zoning Regulations: Sensitive Areas Ordinances apply to sensitive areas including streams, wetlands, erosion hazard areas, landslide hazard areas, steep slopes, and flood areas. Development proposals affecting steep slopes, landslide hazard areas, streams, and wetlands must observe minimum buffer widths. Clearing and grading of erosion hazard areas may be limited, and must be conducted using an approved temporary erosion control plan.

Stormwater Management: Stormwater management policies are being developed to provide for comprehensive management of surface and stormwater and erosion control. Development projects regulated by this code must discharge runoff to its natural location, control flood flows, erosion, and sediment delivery, contain an analysis of offsite impacts, and provide water quality treatment facilities to treat polluted surface and stormwater runoff.

Local Watershed Plans: Local watershed plans are being developed throughout the state and in the Action Area under the authority of the 1998 Watershed Management Act and Salmon Recovery Planning Act. The watershed plans are being developed to address water quality, water quantity, and salmon habitat issues. The State Conservation Commission is working with local governments and watershed stakeholders to complete an analysis of the factors within each Water Resource Inventory Area that limit salmon production. Local governments would receive grants to revise Shoreline Management Plans and Critical Area Ordinances, and are required to adopt a forest conversion ordinance.

Analysis of the Cumulative Effects

If an action is determined to have no direct or indirect negative impact on an element of the environment then it can have no cumulative impact on that environmental element. As described in Section 4, Environmental Consequences, the No Action Alternative was determined to have no direct or indirect effects on the environment at the watershed scale for all resources analyzed, and, therefore, its cumulative impact would be equivalent to a continuation of current

1 environmental trends and conditions. At the reach scale, however, the No Action Alternative
2 could have minor impacts and short-term negative effects associated with soils, air quality, fish
3 (native fish species, salmonid ESUs, threatened and endangered fish species), threatened and
4 endangered wildlife species, aquatic habitat, vegetation, and environmental justice. These reach
5 scale effects may be minor on an individual basis, however, their cumulative effect on the human
6 environment could potentially be negative for a short period of time. In this case, the No Action
7 Alternative does not complement and may conflict with the past, current and foreseeable Federal,
8 Tribal, state, and local plans, policies, and programs influencing fish or their habitat (Table 17).
9 Alternatively, the cumulative impact of the No Action Alternative at the watershed scale may
10 have minor beneficial effects because of past, current, and reasonably foreseeable Federal, Tribal,
11 state, and local plans, policies, and programs aimed at benefitting elements of the Affected
12 Environment such as water quantity and quality, fish passage, shoreline and fish habitat
13 conditions. Federal, Tribal, state, and local plans, programs, and activities include water quality
14 and pollution control, streamflow enhancement, watershed planning, environmental land use
15 planning and zoning, shoreline protection, and habitat conservation plans (Table 17).
16

17 Under the Proposed Action, approval of the Limit 10(ii) RRM Program submitted to NOAA
18 Fisheries by jurisdictions in the state of Washington was determined to have no direct or indirect
19 negative impacts on soils, air quality, water quantity, fish (native fish species, salmonid ESUs,
20 threatened and endangered fish species), threatened and endangered wildlife species, tribal treaty
21 rights, or environmental justice issues, and it could have some beneficial impacts (e.g., improved
22 protection of aquatic habitat and vegetation as compared to the No Action conditions that are
23 described in the EA). As compared to the No Action Alternative, the Proposed Action
24 complements, enhances, and is not in conflict with the past, current, and reasonably foreseeable
25 Federal, Tribal, state, and local plans, policies, and programs described above and summarized in
26 Table 17 because RRM activities carried out under the Proposed Action would improve trends in
27 properly functioning habitat condition and other factors that support the conservation of listed
28 salmonids.
29

30 The Proposed Action provides an option for jurisdictions in Washington to pursue RRM
31 activities, in addition to the ESA section 10 tools to comply with the ESA, when their programs
32 meet the Limit 10(ii) criteria. The Proposed Action fosters a cooperative ESA management
33 relationship between the state, counties, cities, and NOAA Fisheries. The Proposed Action also
34 supports the NOAA Strategic Plan. Thus, the Proposed Action's cumulative effect would be to
35 complement and add to the past, present, and foreseeable Federal, Tribal, state, and local plans,
36 policies, and programs (Table 17) within the range of the 10 ESUs, and add a coordinated
37 conservation tool spanning 28 counties in the State of Washington to protect these salmon and
38 steelhead populations.

Table 17. Summary of past, current, and future programs and the ESUs affected by these programs.

Program Description	Puget Sound Chinook ESU	Lower Columbia Chinook ESU	Upper Willamette Chinook ESU	Ozette Lake Sockeye ESU	Hood Canal Chum ESU	Columbia River Steelhead ESU	Upper Willamette Steelhead ESU	Middle Columbia Steelhead ESU	Snake River Steelhead ESU	Lower Col. Steelhead ESU
Endangered Species Act	X	X	X	X	X	X	X	X	X	X
Corps of Engineers Flood Control Act	X	X	X			X	X	X	X	X
Northwest Forest Plan	X	X	X	X	X	X	X	X	X	X
Clean Water Act	X	X	X	X	X	X	X	X	X	X
Lower Columbia National Estuary Partnership		X	X			X	X	X	X	X
Makah and Quileute Tribal Conservation				X						
Wild Salmon Policy	X	X	X	X	X	X	X	X	X	X
Aquatic Use Authorization	X	X	X	X	X	X	X	X	X	X
Shoreline Management Act	X	X	X	X	X	X	X	X	X	X
Growth Management Act	X	X	X	X	X	X	X	X	X	X

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

Program Description	Puget Sound Chinook ESU	Lower Columbia Chinook ESU	Upper Willamette Chinook ESU	Ozette Lake Sockeye ESU	Hood Canal Chum ESU	Columbia River Steelhead ESU	Upper Willamette Steelhead ESU	Middle Columbia Steelhead ESU	Snake River Steelhead ESU	Lower Col. Steelhead ESU
Forest Practices Rules	X	X	X	X	X	X	X	X	X	X
Hydraulic Project Approvals	X	X	X	X	X	X	X	X	X	X
Watershed Management Act	X	X	X	X	X	X	X	X	X	
Washington Forest Practices Rules	X	X	X	X	X	X	X	X	X	X
Salmon Recovery Planning Act	X	X	X	X	X	X	X	X	X	X
Lower Columbia Fish Recovery Board		X	X			X	X	X	X	X
Tri-County ESA Group	X				X					
Sensitive Areas Ordinances	X	X	X	X	X	X	X	X	X	X
Stormwater Management Policies	X				X					
Columbia River Anadromous Fish Restoration Plan		X	X			X	X	X	X	X

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

Program Description	Puget Sound Chinook ESU	Lower Columbia Chinook ESU	Upper Willamette Chinook ESU	Ozette Lake Sockeye ESU	Hood Canal Chum ESU	Columbia River Steelhead ESU	Upper Willamette Steelhead ESU	Middle Columbia Steelhead ESU	Snake River Steelhead ESU	Lower Col. Steelhead ESU
Shared Strategy for Salmon Recovery	X				X					
State Environmental Policy Act	X	X	X	X	X	X	X	X	X	X
Puget Sound Water Quality Management Plan	X				X					
Watershed Plans	X	X	X	X	X	X	X	X	X	X

1
2
3
4
5
6
7
8
9

6.0 REFERENCES

- 1
2
3 Bailey, R. G. 1995. Description of the ecoregions of the united states. 2nd edition. U. S. Forest
4 Service, Miscellaneous Publications No. 1391, Washington, D.C.
5
6 Beschta, R.L., J.R. Bilby, G.W. Brown, L.B. Holtby, and T.D. Hofstra. 1987. Stream
7 temperature and aquatic habitat: fisheries and forest interactions. Pages 191-232 *In* E.O. Salo
8 and T.W. Cundy, editors. Streamside management: forestry and fishery interactions.
9 University of Washington, College of Forest Research, Seattle, Washington.
10
11 Blumm, M. 2002. Sacrificing the salmon. Book World Publications.
12
13 Bond, C. E. 1992. Notes on the nomenclature and distribution of the bull trout and effects of
14 human activity on the species. Pages 1-4 *In* P. J. Howell and D.V. Buchanan, editors.
15 Proceedings of the Gearhart Mountain Bull Trout Workshop. Oregon Chapter of the American
16 Fisheries Society. Corvallis, Oregon.
17
18 Campbell, P. 1996. Population projections for states by age, sex, race, and hispanic origin: 1995
19 to 2025. Population Projections Branch, Population Division, U. S. Bureau of the Census.
20
21 Chappell, C. B., R. C. Crawford, C. Barrett, J. Kagan, D. H. Johnson, M. O'Mealy, G. A. Green,
22 H. L. Ferguson, W. D. Edge, E. L. Greda, and T. A. O'Neil. 2001. Wildlife habitats:
23 descriptions, status, trends, and system dynamics. Chapter 2 *In* D. H. Johnson and T. A.
24 O'Neil, Managing Directors. Wildlife habitat relationships in oregon and washington.
25 Oregon State University Press, Corvallis, Oregon.
26
27 Csuti, B., A. J. Kimmerling, T. A. O'Neil, M. M. Shaughnessy, E.P. Gaines, and M. M. P. Huso.
28 1997. Atlas of oregon wildlife. Oregon State University Press, Corvallis, Oregon.
29
30 Dahl, T. E. and C. E. Johnson. 1991. Status and trends of wetlands in the coterminous united
31 states, mid-1970s to mid-1980s. U.S. Department of the Interior, Fish and Wildlife Service,
32 Washington, D.C.
33
34 Dahl, T. E. 2000. Status and trends of wetlands in the coterminous united states, 1986 to 1997.
35 U. S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.
36
37 Dentler, J. L. 1993. Noah's farce: the regulation and control of exotic fish and wildlife.
38 University of the Puget Sound Law Review 17:191-242.

- 1 Frey, W.H., and E.L. Fielding. 1995. Changing urban populations: regional restructuring, racial
2 polarization, and poverty concentration. *Cityscape: A Journal of Policy Development and*
3 *Research* 1(2).
4
- 5 Harvey, A.D., P.F. Hessburg, J.W. Byler, G.I. McDonald, J.C. Wetherby, B.E. Wickham. 1994.
6 Health declines in western interior forests: symptoms and solutions: cooperative extension
7 symposium: Washington State University. In: *Proceedings, ecosystem management in western*
8 *interior forests*, May 3-5, 1994. Spokane, Washington.
9
- 10 He, X., and J. F. Kitchell. 1990. Direct and indirect effects of predation on a fish community: a
11 whole lake experiment. *Transactions of the American Fisheries Society* 119:825-835.
12
- 13 Henjum, M.G.; J.R. Karr, D.L. Bottom, J.C.Perry, S.G. Bednarz, S.A. Wright, S.A. Beckwitt.
14 1994. Interim protection for late-successional forests fisheries and watersheds for national
15 forests east of the cascade crest in oregon and washington. *Eastside Forests Scientific Society*
16 *Panel report to the Congress and President of the U.S.* The Wildlife Society, Bethesda,
17 Maryland.
18
- 19 Leubke, R., W. 1978. Evaluation of a multi-predator introduction. Federal Aid Project F-31-R-
20 4.
- 21
- 22 Leonard, W. P. , H. A. Brown, L. L. Jones, K. R. McAllister, and R. M. Storm, 1993.
23 Amphibians and reptiles of washington and oregon. Seattle Audubon Society, Seattle,
24 Washington.
25
- 26 Meyer, J., and S. Brinkman. 1995. Water quality conditions in the lake ozette watershed and
27 potential impacts on salmonids. Draft report. Olympic National Park, Port Angeles,
28 Washington.
29
- 30 National Marine Fisheries Service. 1998. Factors contributing to the decline of chinook salmon:
31 an addendum to the 1996 west coast steelhead factors for decline report. June 1998.
32
- 33 National Marine Fisheries Service. 2000. Environmental assessment of a national marine
34 fisheries service action to modify an incidental take permit issued to the idaho department of
35 fish and game under section 10(a)(1)(b) of the endangered species act.
36
- 37 NOAA Fisheries. 2002a. Limit 10 programmatic environmental assessment. Portland, Oregon.

- 1 National Marine Fisheries Service. 2002b. Programmatic biological opinion and magnuson-
2 stevens act essential fish habitat consultation for standard local operating procedures for
3 endangered species (SLOPES) for certain activities requiring department of army permits in
4 oregon and the north shore of the columbia river.
- 5
- 6 National Research Council. 1996. Upstream: salmon and society in the Pacific Northwest.
7 National Academy Press, Washington, D.C.
- 8
- 9 NOAA. 1997. Investigations of scientific information on the impacts of california sea lions and
10 pacific harbor seals on salmonids and on the coastal ecosystems of washington, oregon, and
11 california. NOAA Technical Memorandum, NMFS-NWFSC-28.
- 12
- 13 Oregon Department of Transportation. 1999. Routine road maintenance best management
14 practices. Salem, Oregon.
- 15
- 16 Oregon Progress Board. 2000. Oregon state of the environment report. Salem, Oregon.
- 17
- 18 Pacific Fishery Management Council. 1999. Appendix A to amendment 14 to the pacific coast
19 salmon plan. Identification and description of essential fish habitat, adverse impacts, and
20 recommended conservation measures for salmon. Portland, Oregon.
- 21
- 22 Pierce County. 2000. Guidance for basin planning. Tacoma, Washington.
- 23
- 24 Quigley, T.M., and S.J. Arbelbide. 1997. An assessment of ecosystem components in the
25 interior columbia basin and portions of the klamath and great basins. USDA, USDI General
26 Technical Report, PNW-GTR-405.
- 27
- 28 Regional Road Maintenance Technical Working Group. 2002. Regional road maintenance
29 endangered species act program guidelines. Olympia, Washington.
- 30
- 31 Regional Road Maintenance Technical Working Group, 2002. Biological review for the regional
32 road maintenance endangered species act program guidelines. Olympia, Washington.
- 33
- 34 Sibley, D. A. 2000. The sibley guide to birds. Alfred A. Knopf, New York.
- 35
- 36 Smith, J. P., and M. W. Collopy. 2002. Pacific Northwest. *In* Status and trends of the nation's
37 biological resources. Volume I. U. S. Department of Interior, U. S. Geological Survey.
38 Reston, Virginia. January 2002.

- 1 Spence, B. C., G. A. Lomnický, R. M. Hughes, and R. P. Novitzki. 1996. An ecosystem
2 approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research
3 Services Corp., Corvallis, Oregon. Available from NOAA Fisheries.
4
- 5 Stahlmaster, M. V. 1987. The bald eagle. Universe Books, New York.
6
- 7 Storm, R. M. and W. P. Leonard, editors. 1995. Reptiles of Washington and Oregon. Seattle
8 Audubon Society, Seattle, Washington.
9
- 10 Swanston, D.N. 1991. Natural processes. Pages 139-179 in W.R. Meehan, editor. Influences of
11 forest and rangeland management on salmonid fishes and their habitat.
12
- 13 U.S. Census Bureau. 2001. Census 2000 data CD-Rom, July 2001.
14
- 15 U. S. Corps of Engineers. 1999. Lower snake river juvenile salmon mitigation feasibility study:
16 draft feasibility report and environmental impact statement.
17
- 18 U.S. Environmental Protection Agency. 1995a. Compilation of emission factors, AP-42,
19 Section 13.2.3.1.
20
- 21 U.S. Environmental Protection Agency. 1995b. Compilation of emission factors, AP-42,
22 Section 13.2.2.
23
- 24 U.S. Environmental Protection Agency. 2001. Our built and natural environment: A technical
25 review of the interactions between land use, transportation, and environmental quality.
26 Development, Community, and Environment Division; Washington, D.C. EPA 231-R-01-002.
27 January 2001.
28
- 29 U.S. Fish and Wildlife Service, National Marine Fisheries Service, and Plum Creek Timber
30 Company. 1999. Plum creek draft environmental impact statement. Boise, Idaho.
31
- 32 U.S. Forest Service. 2000. Interior Columbia basin final environmental impact statement. Walla
33 Walla, Washington.
34
- 35 Washington Conservation Commission. 2000. Salmon habitat limiting factors: Water Resource
36 Inventory Area 15 (East). November 2000.
37
- 38 Washington Department of Ecology. 2000a. 1999 air quality trends in Washington. Air Quality
39 Program. Lacey, Washington.

- 1 Washington Department of Ecology. 2000b. Washington's environmental health 2000. Lacey,
2 Washington.
- 3
- 4 Washington Department of Ecology. 1998. Final list of impaired and threatened waterbodies -
5 the 303(d) list. Water Quality Program. Lacey, Washington.
- 6
- 7 Washington Department of Fish and Wildlife. 2001. Species of concern in washington state.
8 Olympia, Washington.
- 9
- 10 Washington Department of Natural Resources. 1998a. Our changing nature. Natural resource
11 trends in washington state. Olympia, Washington.
- 12
- 13 Washington Department of Natural Resources. 1998b. Changing our water ways. Trends in
14 washington's water systems. Olympia, Washington.
- 15
- 16 Washington Forest Practices Board. 2001. Final environmental impact statement on alternatives
17 for forest practices rules. Olympia, Washington.
- 18
- 19 Washington Natural Heritage Program. 2002. Washington rare plant species by individual
20 county. February 2002.
- 21
- 22 Washington State Office of Financial Management. 2001. Washington statewide population
23 projections. Olympia, Washington.
- 24
- 25 Washington's Statewide Strategy to Recover Salmon. 1999. Extinction is not an option.
26 Olympia, Washington.

Appendix A. Description of ecoregions that intersect with the 10 ESUs (cont'd.).

Ecoregion Province	Ecoregion Location/Size	Vegetation	Wildlife
Pacific Lowland Mixed Forest	Puget-Willamette Lowland, 14,900 mi ² (38,600 km ²)	Historical vegetation was predominately dense coniferous forest of western redcedar, western hemlock, and Douglas-fir. Interior valleys forests were less dense and included deciduous trees, such as big-leaf maple, Oregon ash, and black cottonwood. Some prairies with Oregon white oak, Pacific madrone, Douglas-fir. Swamps/bogs are abundant on poorly drained sites.	Fauna is similar to Cascade Mixed Forest Province. Mountain lion, bobcat are mule deer are common. Western gray squirrel in oak trees. Bushytail wood rat in riparian areas and forest edges. Brush rabbit, gray fox, ruffed grouse in scattered thickets. Dusky Canada goose winters exclusively in the Willamette Valley in Oregon. Periodically abundant acorn crop attracts flocks of band-tailed pigeons, acorn woodpeckers, and mountain quail. Numerous reptiles, including northern Pacific rattlesnake, the only poisonous snake in the Pacific Northwest.
Cascade Mixed Forest - Coniferous Forest - Alpine Meadow	Pacific Northwest, 53,400 mi ² (138,300 km ²)	Dense conifer forests of Douglas-fir, western redcedar, western hemlock, grand fir, silver fir, Sitka spruce, Alaska-cedar and various shrubs at low elevations. Riparian forests contain deciduous black cottonwood and red alder. Redwood in northwestern California. Ponderosa pine forests along the dry eastern slopes of the Cascades are more open and contain grass and shrubs. Higher Cascade elevations have subalpine forests of mountain hemlock, subalpine fir, whitebark pine, and Alaska-cedar. Alpine zone above timberline contains numerous shrub and herb species.	Similar to Pacific Lowland Mixed Forest Province. Large mammals include elk, deer, mountain lion, bobcat, and black bear. Small mammals include mice, Douglas squirrels, martens, Townsend chipmunks, red tree voles, and bushytail wood rats. Common birds are the winter wren, Townsend's warbler, chestnut-backed chickadee, red-breasted nuthatch, gray jay, Steller's jay, blue and ruffed grouse, hawks and owls in the northwest. Spotted owl and marbled murrelet in old-growth forests. Numerous amphibians and reptiles including Pacific treefrog, Pacific giant salamander, northern alligator lizard and rubber boa.
Intermountain Semidesert	Columbia-Snake River Plateaus, Wyoming Basin, 159,100 mi ² (412,100 km ²)	Dominant vegetation is sagebrush, shadscale, and grasses. Riparian vegetation consist of willows and sedges in mountain areas and transitions to greasewood in alkali flats away from the mountains. Western juniper woodland occurs in arid parts of central Oregon. Bunchgrass occurs in more moist areas.	Large mammals include coyote, pronghorn antelope, mountain lion, bobcat, elk, mule deer, and moose in eastern riparian areas. Smaller species include Wyoming ground squirrel, whitetail prairie dog, deer mouse, whitetail jackrabbit, and porcupine. Common migrating and resident bird species include mallards, pintails, green-winged teal, gadwalls, Canada geese and sage grouse. Numerous raptors include Swainson's hawk, ferruginous hawk, rough-legged hawk, red-tailed hawk, marsh hawk, prairie falcon, great horned owl, and burrowing owl. Reptiles include sagebrush lizard, horned lizard, and prairie rattlesnake.

Appendix A. Description of ecoregions that intersect with the 10 ESUs (cont'd.).

Ecoregion Province	Ecoregion Location/Size	Vegetation	Wildlife
Great Plains - Palouse Dry Steppe	Rocky Mountain Piedmont, Upper Missouri Basin Broken Lands, Palouse grassland of Washington and Idaho, 290,700 mi ² (752,900 km ²)	Great Plains grasslands with scattered trees and shrubs (sagebrush, rabbitbrush) occur east of the Rockies. Common grass species include buffalo grass, grama, wheatgrass, and needlegrass. Other plants include sunflower, locoweed, blazingstar, white prickly poppy, and Russian-thistle (tumbleweed). Palouse grasslands are similar to Great Plains except that dominant species are replaced by bluebunch wheatgrass, fescue, and bluegrass.	Buffalo occurred historically. Common large mammals are pronghorn antelope, mule deer, whitetail deer, and coyote. Smaller mammals include jackrabbits; desert cottontail; prairie dogs; thirteen-lined, Washington and Columbia ground squirrel; and badgers. Birds include sage grouse, greater prairie chickens, sharp-tailed grouse, horned lark, lark bunting, and western meadowlark.
Middle Rocky Mountain Steppe - Coniferous Forest - Alpine Meadow	Blue Mountains, Salmon River Mountains, basins and ranges of southwestern Montana, 81,800 mi ² (211,900 km ²)	Plant communities vary distinctly with altitude. Douglas-fir forests with grand fir occur below the subalpine zone on western slopes. Douglas-fir transitions to ponderosa pine at lower elevations. Lodgepole pines and grasses occur in the east and southeast. Shrubs (sagebrush) and grasses occur on plains, lower mountain slopes, and dry south- and west-facing slopes east of the Bitterroot Mountains.	Fauna is similar to that found in the Northern Rocky Mountain Forest Province (below). However, isolated arid mountain regions may contain unique assemblages of species.
Northern Rocky Mountain Forest-Steppe - Coniferous Forest - Alpine Meadow	Northern Idaho, western Montana, eastern Washington, 38,100 mi ² (98,700 km ²)	Engelmann spruce and subalpine fir occur in subalpine areas. These transition to forest of Western redcedar, western hemlock, Douglas-fir, western white pine, western larch, grand fir, and western ponderosa pine at lower elevations. Further south, these montane forests may be mixed with grass and sagebrush.	Large mammals in this province include black bear, deer, elk, mountain goat, mountain lion, and bobcat. Smaller Mammals include Columbia ground squirrel, flying squirrel, marten, redtail chipmunk, and bushytail woodrat. Common birds are hawks, jays, chestnut-backed chickadees, red-breasted nuthatches, great gray owls, blue and ruffed grouse.

Source: Bailey 1995.

APPENDIX B

***Federally Listed Threatened and Endangered
Species -- Washington***

Animals

Common	Scientific	State Status	Federal Status
Goshawk, northern	<i>Accipiter gentilis</i>	C	SC
Grebe, western	<i>Aechmophorus occidentalis</i>	C	SC
Beetle, Beller's ground	<i>Agonum belleri</i>	C	SC
Snail, Newcomb's littorine	<i>Algomorda subrotundata</i>	C	SC
Sparrow, sage	<i>Amphispiza belli</i>	C	SC
Floater, California	<i>Anodonta californiensis</i>	C	SC
Eagle, golden	<i>Aquila chrysaetos</i>	C	SC
Owl, burrowing	<i>Athene cucularia</i>	C	SC
Whale, black right	<i>Balaena glacialis</i>	E	E
Whale, sei	<i>Balaenoptera borealis</i>	E	E
Whale, blue	<i>Balaenoptera musculus</i>	E	E
Whale, fin	<i>Balaenoptera physalus</i>	E	E
Sandpiper, upland	<i>Bartramia longicauda</i>	E	E
Butterfly, silver-bordered fritillary	<i>Boloria selene atrocostalis</i>	E	E
Rabbit, pygmy	<i>Brachylagus idahoensis</i>	C	SC
Murrelet, marbled (CA, OR, WA)	<i>Brachyramphus marmoratus marmoratus</i>	E	T
Goose, Aleutian Canada	<i>Branta canadensis leucopareia</i>	T	SC
Toad, western	<i>Bufo boreas</i>	T	SC
Hawk, ferruginous	<i>Buteo regalis</i>	C	SC
Wolf, gray		T	SC
(lower 48 States, except MN and where XN; Mexico)			
Turtle, loggerhead sea	<i>Canis lupus</i>	E	E
Sucker, mountain	<i>Caretta caretta</i>	T	T
Grouse, sage	<i>Catostomus platyrhynchus</i>	C	C
Swift, Vaux's	<i>Centrocercus urophasianus</i>	T	C
Plover, snowy	<i>Chaetura vauxi</i>	C	C
Plover, western snowy (Pacific coastal pop.)	<i>Charadrius alexandrinus</i>	E	T
Sea turtle, green (except where endangered)	<i>Charadrius alexandrinus nivosus</i>	E	T
Beetle, Columbia River tiger	<i>Chelonia mydas</i>	T	T
Turtle, western pond	<i>Cicindela columbica</i>	C	T
Herring, Pacific (Cherry Point)	<i>Clemmys marmorata</i>	E	SC
Herring, Pacific (Discovery Bay)	<i>Clupea pallasii</i>	C	C
Cuckoo, yellow-billed	<i>Clupea pallasii</i>	C	C
Snake, sharptail	<i>Coccyzus americanus</i>	C	C
	<i>Contia tenuis</i>	C	C

Appendix E. Federally Listed Threatened and Endangered Species - Washington

Common	Scientific	State Status	Federal Status
Bat, Townsend's big-eared	<i>Corynorhinus townsendii</i>	C	SC
Chub, lake	<i>Couesius plumbeus</i>	C	
Sea turtle, leatherback	<i>Dermochelys coriacea</i>	E	E
Beetle, long-horned leaf	<i>Donacia idola</i>	C	
Woodpecker, pileated	<i>Dryocopus pileatus</i>	C	
Beetle, Hatch's click	<i>Eanus hatchii</i>	C	SC
Sea otter	<i>Enhydra lutris</i>	E	
Lark, Streaked horned	<i>Eremophila alpestris strigata</i>	C	C
Sea-lion, Steller (eastern pop.)	<i>Eumetopias jubatus</i>	T	T
Butterfly, Taylor's (Whulge) checkerspot	<i>Euphydryas editha taylori</i>	C	C
Merlin	<i>Falco columbarius</i>	C	
Falcon, peregrine	<i>Falco peregrinus</i>	E	SC
Limpet, giant Columbia River	<i>Fisherola nuttalli</i>	C	
Snail, Great Columbia River spire	<i>Fluminicola columbiana</i>	C	SC
Puffin, tufted	<i>Fratercula cirrhata</i>	C	SC
Cod, Pacific (S&C Puget sound)	<i>Gadus macrocephalus</i>	C	
Crane, sandhill	<i>Grus canadensis</i>	E	
Wolverine	<i>Gulo gulo</i>	C	SC
Butterfly, Chinquapin Hairstreak	<i>Habrodais grunus herri</i>	C	
Eagle, bald (lower 48 States)	<i>Haliaeetus leucocephalus</i>	T	T
Abalone, northern	<i>Haliotis kamtschatkana</i>	C	
Lamprey, river	<i>Lampetra ayresi</i>	C	SC
Kingsnake, California mountain	<i>Lampropeltis zonata</i>	C	
Shrike, loggerhead	<i>Lanius ludovicianus</i>	C	SC
Turtle, Olive Ridley sea	<i>Lepidochelys olivacea</i>	C	T
Jackrabbit, black-tailed	<i>Lepus californicus</i>	C	
Jackrabbit, white-tailed	<i>Lepus townsendii</i>	C	
Butterfly, Makah (Queen Charlotte) Copper	<i>Lycaena mariposa chalotensis</i>	C	SC
Lynx, Canada (lower 48 States)	<i>Lynx canadensis</i>	T	T
Fisher	<i>Martes pennanti</i>	E	SC
Whipsnake, striped	<i>Masticophis taeniatus</i>	C	
Whale, humpback	<i>Megaptera novaeangliae</i>	E	E
Woodpecker, Lewis'	<i>Melanerpes lewis</i>	C	
Hake, Pacific (C. Puget Sound)	<i>Merluccius productus</i>	C	
Vole, gray-tailed	<i>Microtus canicaudus</i>	C	
Vole, Shaw Island Townsend's	<i>Microtus townsendii pugeli</i>	C	C

Appendix E. Federally Listed Threatened and Endangered Species - Washington

Common	Scientific	State Status	Federal Status
Butterfly, Johnson's Hairstreak	<i>Mitoura grynea barryi</i>	C	
Butterfly, Juniper Hairstreak	<i>Mitoura johnsoni</i>	C	
Bat, Keen's myotis	<i>Myotis keenii</i>	C	
Butterfly, Yuma skipper	<i>Ochlodes yuma</i>	C	
Deer, Columbian white-tailed	<i>Odocoileus virginianus leucurus</i>	C	E
Butterfly, great arctic	<i>Oeneis nevadensis gigas</i>	E	
Salmon, chum (Columbia R.)	<i>Oncorhynchus (=Salmo) keta</i>	C	T
Salmon, chum (summer-run Hood Canal)	<i>Oncorhynchus (=Salmo) keta</i>	C	T
Steelhead (upper Columbia R. Basin)	<i>Oncorhynchus (=Salmo) mykiss</i>	C	E
Steelhead (Snake R. Basin)	<i>Oncorhynchus (=Salmo) mykiss</i>	C	T
Steelhead (upper Willamette R.)	<i>Oncorhynchus (=Salmo) mykiss</i>	C	T
Steelhead (lower Columbia R.)	<i>Oncorhynchus (=Salmo) mykiss</i>	C	T
Salmon, sockeye U.S.A.	<i>Oncorhynchus (=Salmo) mykiss</i>	C	T
(Snake River, ID stock wherever found)			
Salmon, sockeye U.S.A. (Lake Ozette)	<i>Oncorhynchus (=Salmo) nerka</i>	C	E
Salmon, chinook (spring/summer Snake R.)	<i>Oncorhynchus (=Salmo) nerka</i>	C	T
Salmon, chinook (fall Snake R.)	<i>Oncorhynchus (=Salmo) tshawytscha</i>	C	T
Salmon, chinook (spring upper Columbia R.)	<i>Oncorhynchus (=Salmo) tshawytscha</i>	C	T
Salmon, chinook (lower Columbia R.)	<i>Oncorhynchus (=Salmo) tshawytscha</i>	C	E
Salmon, chinook (Puget Sound)	<i>Oncorhynchus (=Salmo) tshawytscha</i>	C	T
Whale, orca	<i>Orcinus orca</i>	C	T
Thrasher, sage	<i>Oreoscoptes montanus</i>	C	
Oyster, Olympia	<i>Ostrea lurida</i>	C	
Owl, flammulated	<i>Otus flammulated</i>	C	
Butterfly, Shepard's parnassian	<i>Parnassius clodius shapardi</i>	C	
Pelican, American white	<i>Pelecanus erythrorhynchos</i>	C	
Pelican, brown (except U.S. Atlantic coast, FL, AL)	<i>Pelecanus occidentalis</i>	E	
Cormorant, Brandt's	<i>Phalacrocorax penicillatus</i>	E	E
Porposie, Pacific harbor	<i>Phocoenaphocoena</i>	C	
Albatross, short-tailed	<i>Phoebastria (=Diomedea) albatrus</i>	C	E
Whale, sperm	<i>Physeter macrocephalus</i>	E	E
Woodpecker, white-headed	<i>Picoides albolarvatus</i>	C	
Woodpecker, black-backed	<i>Picoides arcticus</i>	C	
Butterfly, Puget blue	<i>Plebejus icarioides blackmorei</i>	C	
Salamander, Van dyke's	<i>Plethodon vandykei</i>	C	
Salamander, Dunn's	<i>Plethodon dumni</i>	C	SC

Appendix E. Federally Listed Threatened and Endangered Species - Washington

Common	Scientific	State Status	Federal Status
Salamander, Larch mountain	<i>Plethodon larselli</i>	S	SC
Butterfly, Mardon skipper	<i>Polites mardon</i>	E	C
Sparrow, Oregon vesper	<i>Poocetes gramineus affinis</i>	C	SC
Martin, purple	<i>Progne subis</i>	C	
Auklet, Cassin's	<i>Ptychoramphus aleauticus</i>	C	SC
Frog, Columbia spotted	<i>Rana luteiventris</i>	C	SC
Frog, northern leopard	<i>Rana pipiens</i>	E	
Frog, Oregon spotted	<i>Rana pretiosa</i>	E	C
Caribou, woodland (ID, WA, B.C.)	<i>Rangifer tarandus caribou</i>	E	E
Dace, leopard	<i>Rhinichthys falcatus</i>	C	
Dace, Umatilla	<i>Rhinichthys falcatus</i>	C	
Salamander, Cascade torrent	<i>Rhyacotriton cascadae</i>	C	
Salamander, Columbia torrent	<i>Rhyacotriton kezeri</i>	C	SC
Trout, bull (U.S.A., coterminous, lower 48 states)	<i>Salvelinus confluentus</i>	C	T
Beetle, Mann's mollusk-eating ground	<i>Scaphinotus manni</i>	C	
Squirrel, western gray	<i>Sciurus griseus</i>	T	SC
Rockfish, brown	<i>Sebastes auriculatus</i>	C	
Rockfish, copper	<i>Sebastes caurinus</i>	C	
Rockfish, greenstriped	<i>Sebastes elongatus</i>	C	
Rockfish, widow	<i>Sebastes entomelas</i>	C	
Rockfish, yellowtail	<i>Sebastes flavidus</i>	C	
Rockfish, quillback	<i>Sebastes maliger</i>	C	
Rockfish, black	<i>Sebastes melanops</i>	C	
Rockfish, China	<i>Sebastes nebulosus</i>	C	
Rockfish, tiger	<i>Sebastes nigrocinctus</i>	C	
Rockfish, bocaccio	<i>Sebastes paucispinis</i>	C	
Rockfish, canary	<i>Sebastes pinniger</i>	C	
Rockfish, redstripe	<i>Sebastes propiger</i>	C	
Rockfish, yelloweye	<i>Sebastes ruberrimus</i>	C	
Nuthatch, slender-billed white-breasted	<i>Sitta carolinensis aculeata</i>	C	SC
Shrew, Merriam's	<i>Sorex merriami</i>	C	
Squirrel, Washington ground	<i>Spermophilus washingtoni</i>	C	C
Butterfly, valley silverspot	<i>Speyeria zerene bremerii</i>	C	SC
Butterfly, Oregon silverspot	<i>Speyeria zerene hippolyta</i>	E	T
Owl, spotted	<i>Strix occidentalis</i>	E	T
Owl, northern spotted	<i>Strix occidentalis caurina</i>		T

Appendix E. Federally Listed Threatened and Endangered Species - Washington

Common	Scientific	State Status	Federal Status
Eulachon	<i>Thaleichthys pacificus</i>	C	
Pollock, walleye (So. Puget sound)	<i>Theragra chalcogramma</i>	C	
Gopher, Mazama (western) pocket	<i>Thomomys mazama</i>	C	C
Gopher, brush prairie pocket	<i>Thomomys talpoides douglasi</i>	C	
Grouse, sharp-tailed	<i>Tympanuchus</i>	T	SC
Murre, common	<i>Uria aalge</i>	C	
Bear, grizzly (lower 48 States, except where listed as an experimental population)	<i>Ursus arctos horribilis</i>	E	T

Federal species information retrieved from: http://ecos.fws.gov/webpage/webpage_usa_lists.html?state=all

Washington species information retrieved from: Washington Department of Fish and Wildlife. <http://www.wa.gov/wdfw/wlm/diversity/soc/soc.htm>

Plants

Common	Scientific	State Status	Federal Status
Sandverbena, pink	<i>Abronia umbellata</i> ssp. <i>Acutalata</i>	X	
Onion, blue mountain	<i>Allium dictyon</i>	T	
Sandwort, Marsh	<i>Arenaria paludicola</i>	X	E
Wormwood, northern	<i>Artemisia campestris</i> ssp. <i>Borealis</i>	E	C
Aster, rush	<i>Aster borealis</i>	T	
Aster, Jessica's	<i>Aster jessicae</i>	E	
Milk-vetch, cotton's	<i>Astragalus australis</i> var. <i>olympicus</i>	T	
Milk-vetch, Columbia	<i>Astragalus columbianus</i>	T	
Milk-vetch, transparent	<i>Astragalus diaphanus</i>	T	
Milk-vetch, thistle	<i>Astragalus kentrophyta</i> var. <i>douglasii</i>	X	
Milk-vetch, Ames'	<i>Astragalus pulsiferae</i> var. <i>suksdorfii</i>	X	
Milk-vetch, Whited's	<i>Astragalus sinuatus</i>	E	
Mariposa, broad-fruit	<i>Calochortus nitidus</i>	E	
Evening-primrose, dwarf	<i>Camissonia pygmaea</i>	T	
Paintbrush, golden	<i>Castilleja levisecta</i>	T	
Bugbane, tall	<i>Cimicifuga elata</i>	E	T
Corydalis, Clackamas	<i>Corydalis aquae-gelidae</i>	T	
Draba, Douglas'	<i>Cusickiella douglasii</i>	T	
Lady's-slipper, clustered	<i>Cypripedium fasciculatum</i>	T	
Lady's-slipper, yellow	<i>Cypripedium parviflorum</i>	T	
Larkspur, pale	<i>Delphinium leucophaeum</i>	E	

Appendix E. Federally Listed Threatened and Endangered Species - Washington

Common	Scientific	State Status	Federal Status
Shootingstar, frigid	<i>Dodecatheon austrofrigidum</i>	T	
Eatonella, white	<i>Eatonella nivea</i>	T	
Spike-rush, purple	<i>Eleocharis atropurpurea</i>	X	
Daisy, basalt	<i>Erigeron basalticus</i>	T	C
Daisy, Howell's	<i>Erigeron howellii</i>	T	
Daisy, gorge	<i>Erigeron oreganus</i>	T	
Buckwheat, Umtanum desert	<i>Eriogonum cōdium</i>	E	C
Buckwheat, spotted	<i>Eriogonum mascatum</i>	X	
Coyote-thistle, Oregon	<i>Eryngium petiolatum</i>	T	
Queen-of-the-forest	<i>Filipendula occidentalis</i>	T	
Stickseed, showy	<i>Hackelia venusta</i>	E	PE
Goldenweed, Palouse	<i>Haplopappus latriflorus</i>	T	
Howellia, water	<i>Howellia aquatilis</i>	T	T
Rush, dwarf	<i>Juncus hemiendytus</i> var. <i>hemiendytus</i>	X	
Rush, Kellogg's	<i>Juncus kelloggii</i>	T	
Rush, Tiehm's	<i>Juncus tiehmii</i>	T	
Peavine, thin-leaved	<i>Lathyrus holochlorus</i>	T	
Peavine, Torrey's	<i>Lathyrus torreyi</i>	T	
Bladderpod, white bluffs	<i>Lesquerella tuplashensis</i>	T	C
Twayblade	<i>Liparis loeselii</i>	E	
Lobelia, water	<i>Lobelia dortmanna</i>	E	
Lobelia, Kalm's	<i>Lobelia kalmii</i>	E	
Loeflingia	<i>Loeflingia squarrosa</i> var. <i>squarrosa</i>	T	
Lomatium, Bradshaw's	<i>Lomatium bradshawii</i>	E	E
Desert-parsley, Cusick's	<i>Lomatium cusickii</i>	X	
Desert-parsley, Rollins'	<i>Lomatium rollinsii</i>	T	
Desert-parsley, Hoover's	<i>Lomatium tuberosum</i>	T	
Lupine, Sabin's	<i>Lupinus sabinii</i>	E	
Lupine, Kincaid's	<i>Lupinus sulphureus</i> (=oreganus) ssp. <i>kincaidii</i>	E	T
Meconella, white	(=var. <i>kincaidii</i>)		
Microseris, coast	<i>Meconella oregana</i>	T	
Monkey-flower, liverwort	<i>Microseris bigelovii</i>	X	
Navarretia, marigold	<i>Mimulus jungermannioides</i>	X	
Water-lily, pygmy	<i>Navarretia tagelina</i>	T	
Evening-primrose, long-tubed	<i>Nymphaea tetragona</i>	X	
	<i>Oenothera flava</i>	X	

Appendix E. Federally Listed Threatened and Endangered Species - Washington

Common	Scientific	State Status	Federal Status
Adder's-tongue	<i>Ophioglossum pusillum</i>	T	
Owl-clover, Rosy	<i>Orthocarpus bracteosus</i>	T	
Crazyweed, Columbia	<i>Oxytropia campestris</i> var. <i>columbiana</i>	T	
Crazyweed, Wanapum	<i>Oxytropia campestris</i> var. <i>wanapum</i>	E	
Beardtongue, Barrett's	<i>Penstemon barrettiae</i>	T	
Rockmat, Chelan	<i>Petrophyton cinerascens</i>	T	
Phacelia, sticky	<i>Phacelia lenta</i>	T	
Bog-orchid, Choris'	<i>Platanthera chorisiana</i>	T	
Bluegrass, loose-flowered	<i>Poa laxiflora</i>	T	
Bluegrass, ocean-bluff	<i>Poa unilateralis</i>	T	
Polemonium, great	<i>Polemonium carneum</i>	T	
Polemonium, Washington	<i>Polemonium pectinatum</i>	T	
Buttercup, obscure	<i>Ranunculus reconditus</i>	T	
Yellowcress, persistentsepal	<i>Rorippa columbiana</i>	T	
Raspberry, northwest	<i>Rubus nigerrimus</i>	T	
Willow, soft-leaved	<i>Salix sessilifolia</i>	E	
Willow, rock	<i>Salix vestita</i> var. <i>erecta</i>	T	
Checker-mallow, hairy-stemmed	<i>Sidalcea hirtipes</i>	X	
Checker-mallow, rose	<i>Sidalcea malviflora</i> ssp. <i>Virgata</i>	E	
Checker-mallow, Nelson's	<i>Sidalcea nelsoniana</i>	X	
Checkermallow, Wenatchee Mountains	<i>Sidalcea oregana</i> var. <i>calva</i>	E	T
Silene, Seely's	<i>Silene seelyi</i>	E	E
Silene, Spalding's	<i>Silene spaldingii</i>	T	
Grass, pale blue-eyed	<i>Sisyrinchium sarmentosum</i>	T	T
Ladies'-tresses, Ute	<i>Spiranthes diluvialis</i>	T	
Sullivantia, Oregon	<i>Sullivantantia oregana</i>	T	T
Tauschia, Hoover's	<i>Tauschia hooveri</i>	T	
Tauschia, Leiberg's	<i>Tauschia tenuissima</i>	T	
Clover, Thompson's	<i>Trifolium thompsonii</i>	X	
Violet, kidney-leaved	<i>Viola reniflora</i>	T	X

Federal species information retrieved from: http://ecos.fws.gov/webpage/webpage_usa_lists.html?state=all

Washington species information retrieved from: Washington Natural Heritage Program, 2002. <http://www.wa.gov/dnr/htdocs/fr/nhp/refdesk/lists/plantntrk.html>

Updated 9/24/2001
 Accessed 2/20/2002

APPENDIX C

Tribal Governments in the Analysis Area

Tribal Governments in the Analysis Area

- 1
- 2
- 3 Lower Elwha Klallam Tribe
- 4
- 5 Lummi Indian Nation
- 6
- 7 Muckleshoot Indian Tribe
- 8
- 9 Nisqually Indian Tribe
- 10
- 11 Nooksack Indian Tribe
- 12
- 13 Point No Point Treaty Council
- 14
- 15 Port Gamble S'Kallam Tribe
- 16
- 17 Puyallup Tribe
- 18
- 19 Quileute Tribe
- 20
- 21 Samish Indian Tribe
- 22
- 23 Sauk_Suiattle Tribe
- 24
- 25 Skokomish Tribe
- 26
- 27 Skagit System Cooperative
- 28
- 29 Snoqualmie Tribe
- 30
- 31 Squaxin Island Tribe
- 32
- 33 Stillaguamish Tribe
- 34
- 35 Suquamish Tribe
- 36
- 37 Swinomish Indian Tribal Community
- 38
- 39 Tualip Tribes
- 40
- 41 Upper Skagit Tribe
- 42
- 43 Yakama Nation

Appendix D

Percent ethnicity by county in the analysis area in 2000.

County in Analysis Area	Total Population 2000	Persons/square mile	Caucasian (percent, 2000)	African American (percent, 2000)	Asian (percent, 2000)	Hispanic (percent, 2000)	Native American (percent, 2000)	Other
Asotin	20,551	32.4	94.5	0.2	0.5	2.0	1.3	2.4
Benton	142,475	83.7	81.7	0.9	2.2	12.5	0.8	9.8
Clallam	64,525	37.1	87.4	0.8	1.1	3.4	5.1	3.8
Clark	345,238	549.7	86.6	1.7	3.2	4.7	0.8	5.5
Columbia	4,064	4.7	90.7	0.2	0.4	6.3	1.0	4.6
Cowlitz	92,948	81.6	89.9	0.5	1.3	4.6	1.5	4.8
Franklin	49,347	39.7	47.6	2.5	1.6	46.7	0.7	33.2
Garfield	2,397	3.4	96.1	0.0	0.7	2.0	0.4	2.5
Island	71,558	334.0	85.1	2.4	4.2	4.0	1.0	5.2
Jefferson	25,953	14.3	91.0	0.4	1.2	2.1	2.3	3.9
King	1,737,034	817.0	73.4	5.4	10.8	5.5	0.9	7.2
Kitsap	231,969	585.8	82.2	2.9	4.4	4.1	1.6	6.8
Kittitas	33,362	14.5	89.4	0.7	2.2	5.0	0.9	4.4
Klickitat	19,161	10.2	85.2	0.3	0.7	7.8	3.5	7.9
Lewis	68,600	28.5	90.6	0.4	0.7	5.4	1.2	4.8
Mason	49,405	51.4	86.3	1.2	1.1	4.8	3.7	5.5
Pacific	20,984	22.5	88.0	0.2	2.1	5.0	2.4	4.7
Pierce	700,820	417.4	76.0	7.0	5.1	5.5	1.4	8.1
San Juan	14,077	80.4	93.7	0.3	0.9	2.4	0.8	3.0
Skagit	102,979	59.4	83.0	0.4	1.5	11.2	1.9	9.8
Skamania	9,872	6.0	90.4	0.3	0.5	4.0	2.2	4.8
Snohomish	606,024	290.1	83.4	1.7	5.8	4.7	1.4	4.6
Thurston	207,355	285.2	83.4	2.4	4.4	4.5	1.5	6.1
Wahkiakum	3,824	14.5	92.7	0.3	0.5	2.6	1.6	4.2
Walla Walla	55,180	43.4	78.8	1.7	1.1	15.7	0.8	11.0
Whatcom	166,814	78.7	86.2	0.7	2.8	5.2	2.8	5.3
Whitman	40,740	18.9	86.7	1.5	5.5	3.0	0.7	4.1
Yakima	222,581	51.8	56.5	1.0	1.0	35.9	4.5	28.0

Source: U.S. Census Bureau 2001.