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National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
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Refer to:
2002/01254 (FS)
2002/01880 (BLM)

February 25, 2003

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Re: Endangered Species Act Section 7 Formal consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for U.S. Forest Service and Bureau of Land Management Programmatic Activities in Northwestern Oregon

Dear Agency Administrators:

Enclosed is a biological and conference opinion (Opinion) prepared by the National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of 10 programmatic categories of land management activities. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of listed Oregon Coast coho salmon (*Oncorhynchus kisutch*); Lower Columbia River,

Upper Willamette River, and Middle Columbia River steelhead (*O. mykiss*); Lower Columbia River and Upper Willamette River chinook salmon (*O. tshawytscha*); or Columbia River chum salmon (*O. keta*); or Oregon Coast steelhead and Lower Columbia/Southwest Washington coho salmon which are candidates for listing. As required by section 7 of the ESA, NOAA Fisheries has included reasonable and prudent measures with nondiscretionary terms and conditions that NOAA Fisheries believes are necessary to minimize incidental take associated with this action.

This document also serves as consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR Part 600. In this consultation, NOAA Fisheries concludes that the proposed action may adversely affect designated EFH for Pacific salmon, coastal pelagic species, and west coast groundfish. NOAA Fisheries has included conservation recommendations to avoid, minimize, or otherwise offset affects to designated EFH produced by this project.

If you have questions regarding this consultation, please contact Ron Lindland or Rob Markle of my staff, in the Oregon Habitat Branch at 503.231.2315 or 503.230.5419, respectively.

Sincerely,

For Michael R Crouse

D. Robert Lohn
Regional Administrator

cc: Brad Goehring, USFWS

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

10 Categories of Forest Service and Bureau of Land Management Programmatic Activities in Northwestern Oregon

Agencies:	Willamette, Mt. Hood, and Siuslaw National Forests; Columbia River Gorge National Scenic Area (Oregon portion); and Salem and Eugene Bureau of Land Management Districts
Consultation Conducted By:	National Marine Fisheries Service, Northwest Region
Date Issued:	February 25, 2003
Issued by:	For Michael R Crouse D. Robert Lohn Regional Administrator
Refer to:	**2002/01254 (FS)** **2002/01880 (BLM)**

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1. INTRODUCTION

1.1 Consultation History

On October 16, 2002, the National Marine Fisheries Service (NOAA Fisheries) received a request from the Willamette National Forest, Mt. Hood National Forest, Siuslaw National Forest, and Columbia River Gorge National Scenic Area units of the U.S. Forest Service (FS); and the Salem and Eugene Bureau of Land Management (BLM) Districts for formal and informal consultation pursuant to section 7 of the Endangered Species Act (ESA) and consultation pursuant to section 305(b) of the Magnuson-Stevens Fishery Management and Conservation Act (MSA) for 16 programmatic categories of land management activities in northwestern Oregon (Figure 1). A biological assessment (BA) dated October 9, 2002, accompanied the letter.

The BA was prepared by fisheries biologists from the relevant FS and BLM administrative units. NOAA Fisheries and U.S. Fish and Wildlife Service (USFWS) staff provided technical assistance as part of the joint Oregon Coast/Willamette Level 1 ESA Consultation Streamlining Team (Level 1 Team) in accordance with the February 26, 1997 (revised June 1999), consultation streamlining guidelines (NOAA Fisheries *et al*. 1999). In the BA, the FS and BLM used procedures established in NOAA Fisheries (1996a) to determine the effects of the proposed actions relative to the environmental baseline at the project[1] (or site) and watershed[2] scales, using criteria based on the biological requirements of Pacific salmon (*i.e.*, salmon and steelhead). In addition, the BA provided an evaluation of the effects the proposed programmatic categories of activities would have on habitat designated as essential fish habitat (EFH) under the MSA. The FS and BLM state in the BA that the proposed actions are consistent with the Northwest Forest Plan's (NFP) standards and guidelines (FS and BLM 1994).

NOAA Fisheries decided during consultation to hold in abeyance three programmatic categories of activities due to concerns that not all of the effects of these categories could be accurately predicted. These programmatic categories of activities are: (1) Discretionary road use permits; (2) discretionary right-of-ways, easements and grants; and (3) water withdrawal, facility and transmission permit/right-of-way renewal. Following resolution of outstanding issues, NOAA Fisheries will resume consultation on these categories.

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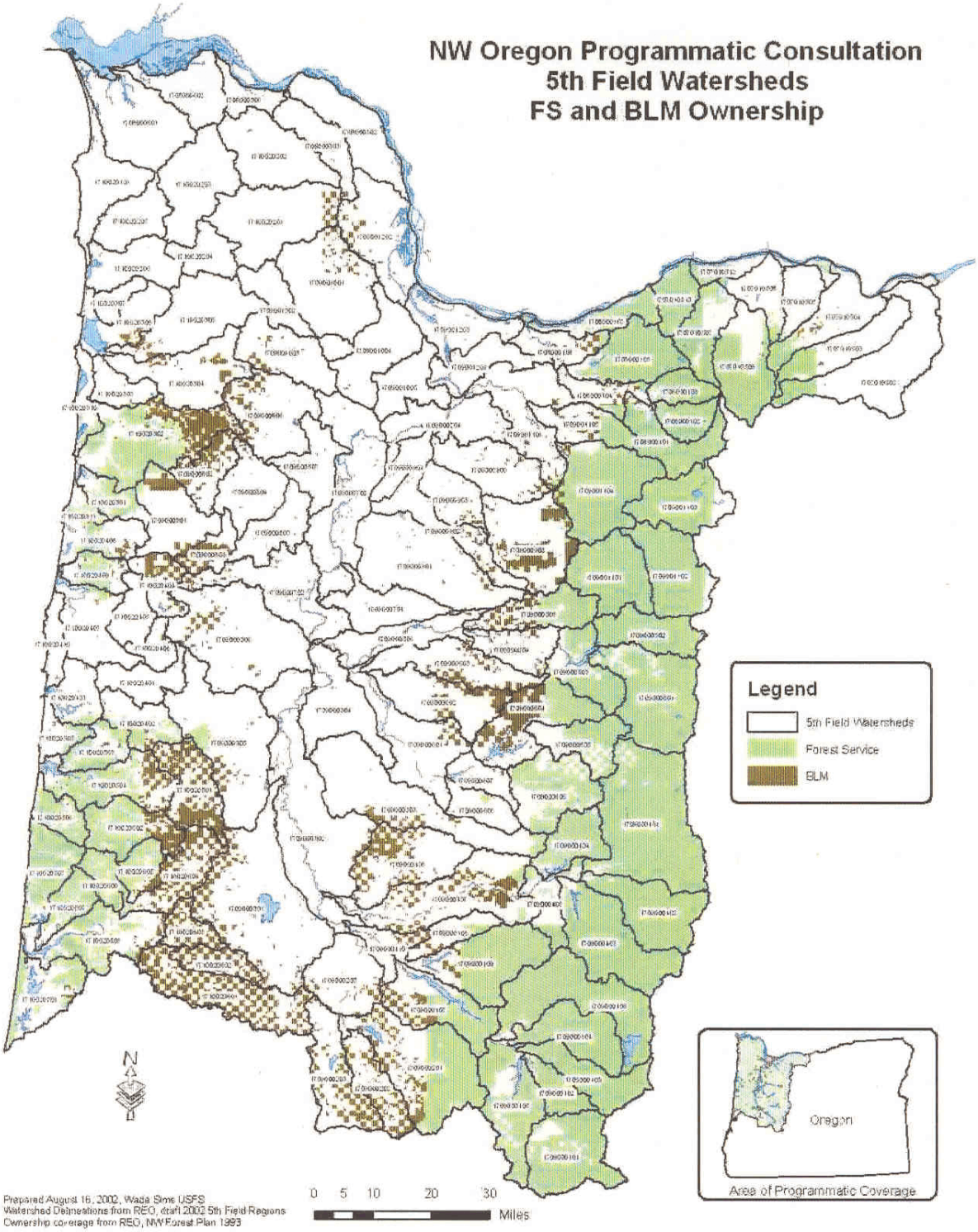
[1] Project sites are areas of variable size, but typically range from tens to hundreds of acres, and are where specific management activities take place (FEMAT 1993, p. V-59).

[2] A watershed is the drainage basin contributing water, organic material, dissolved nutrients, and sediments to a stream or lake. For the purposes of this consultation, watershed will refer to the "fifth field" hydrologic unit code (HUC) watersheds which have been cooperatively delineated by the FS and BLM. Watersheds are made up of smaller drainage basins known as subwatersheds. Watersheds (and some large subwatersheds or aggregates of watersheds) are the proper size for conducting Watershed Analysis and assessing many key processes and features affecting ecosystem function.

Figure 1. Geographic coverage of the Northwest Oregon Programmatic consultation.



The FS and BLM determined in the BA that three of the remaining 13 programmatic categories were "not likely to adversely affect" (NLAA) ESA-listed Pacific salmon. NOAA Fisheries addressed these categories in a separate response under informal consultation (refer to: 2002/01883 [FS] and 2002/01882 [BLM]). These programmatic categories are: (1) Repair of storm damaged roads, (2) road prism salvage and tree clearing, and (3) special forest products and ornamental rock collecting.

The FS and BLM determined that activities in the remaining 10 programmatic categories were "likely to adversely affect" (LAA) Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*); Lower Columbia River (LCR), Upper Willamette River (UWR), and Middle Columbia River (MCR) steelhead (*O. mykiss*); LCR and UWR chinook salmon (*O. tshawytscha*); and Columbia River (CR) chum salmon (*O. keta*). These 10 programmatic categories are the subject of this document.

The FS and BLM also requested conferencing under the ESA for the candidate species OC steelhead (*O. mykiss*) and Lower Columbia/Southwest Washington (LCSW) coho salmon (*O. kisutch*). Species considered in this biological opinion (Opinion) are: LCR, UWR, and MCR steelhead; LCR and UWR chinook salmon; OC coho salmon; CR chum salmon (all currently listed as threatened under the ESA); and OC steelhead and LCSW coho, which are candidates for listing.

1.2 Proposed Action

The proposed action is the implementation by the FS and BLM of land management activities (NLAA and LAA) in each of the 10 programmatic categories listed in Table 1 below. The BA describes the actions within each programmatic category, the environmental baseline in the action area, and the potential effects of the actions on LCR, UWR, MCR, and OC steelhead; LCR and UWR chinook salmon; OC and LCSW coho salmon; and CR chum salmon.

The FS and BLM developed a watershed activity table for each 5 th field watershed and summarized average annual totals for each activity within the entire action area (BA: pages 49-57). An excerpt of that table is included in this Opinion as Appendix A. The tables forecast the amount of "may affect" programmatic actions that the action agencies expect to occur **each fiscal year** within each programmatic category over the next five years (fiscal years 2003-2007) within each watershed. The forecasted numbers are projected estimates based on past funding levels, past reporting and program priorities, program manager's projections, professional judgement, and existing strategies that direct work to specific watersheds.

Descriptions of each programmatic activity category are provided below. All activities would be completed in compliance with each agency's respective best management practices (BMPs) (BA: Appendix E) and in accordance with project design criteria (PDCs). A table describing the proposed activities, the project design criteria, typical effects levels, and the reporting requirements for each category was provided by the FS and BLM (BA: pages 30-47). An excerpt of the table containing the subject programmatic categories has also been included in this

Opinion (Table 2).

Table 1. FS and BLM programmatic categories of actions that are likely to adversely affect LCR, UWR, MCR, and OC steelhead; LCR and UWR chinook salmon; OC and LCSW coho salmon; and CR chum salmon.

Programmatic Activity
Road maintenance and storm proofing
Road decommissioning and obliteration
Aquatic and riparian habitat projects
Recreation site, trail, and administrative structure maintenance and associated public use
Fisheries, wildlife, botany, and cultural programs (including near-stream and instream surveys)
Pump chance/helipond maintenance and use
Rock quarry operations
Non-commercial vegetation treatments
Miscellaneous special use permits and leases(surface water recreation only)
Telephone line and power line renewal special use permits/right-of-way grants

The proposed project design criteria were developed by the Level-1 Team as conservation measures, and are adopted as terms and conditions of the incidental take statement that accompanies this Opinion. The process of developing conservation measures narrowed the scope of proposed activities to include only those with effects that are likely to be minor, repetitive, and predictable. Proposed activities that may have unpredictable or site-specific effects require an individual consultation and are not covered under this Opinion.

Included in the proposed action is the requirement that an action agency fisheries biologist individually review each proposed activity to be completed under this programmatic Opinion prior to implementation to determine whether the activity meets the conditions of the programmatic BA and this Opinion. If the activity meets the conditions, the fisheries biologist would determine the activity's effects on listed fish. A written record of the effects analysis and determination (Appendix B) would be filed with each project's related paperwork at the appropriate FS and BLM unit. Activities that do not meet the programmatic conditions or exceed the range of effects analyzed could not be conducted under the proposed action and would be referred for individual consultation, if appropriate.

The BA included a glossary of terms as they apply to this consultation (BA: pages 11 and 12). Two important terms are repeated below.

Fully Stocked: For purposes of this consultation, fully stocked refers to the presence of enough conifers of adequate sizes in riparian areas in the vicinity of the project area such that the cutting of selected trees is not reasonably likely to reduce recruitment of large woody debris into stream channels or increase stream temperature.

Riparian Area: For purposes of this consultation, the area along each side of a stream or body of water that directly influences fish habitat components[3] (*e.g.*, streambank vegetation, channel structure, and water quality). A default distance equal to one site potential tree height from the edge of a stream channel or water body will include these areas for most components, although actual distance could be different depending on site conditions and the nature of the specific component.

[3] NOAA Fisheries understands this to include the 100-year floodplain.

Table 2. The proposed action includes implementation in accordance with project design criteria and reporting. The effects determination was made with the understanding that actions would be completed in accordance with the design criteria.

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Road Maintenance and Storm Proofing Road maintenance and storm proofing is used to maintain safety; control, reduce and/or prevent road erosion and sedimentation; and maintain or restore hydrologic function. Road maintenance and storm proofing typically include heavy equipment for surface maintenance (grading, leveling), drainage maintenance, installation, replacement, or repair (ditch-lines, water dips, cross-drain culverts, and water bars), removal of fill to reduce potential sediment transport, vegetation management (brushing, limbing, seeding, mowing, and mulching), road cut and fill repair/stabilization, surface repair/replacement (paving, repaving, chip-sealing and rocking), small slide removal (*i.e.*, routinely, quickly, and easily handled with typical maintenance equipment), snow-plowing, dust abatement (with water only), and maintenance and repair of structures (guardrails, signs, relief and stream crossing culverts, bridges). This category also includes immediate stabilization of storm-damaged roads to prevent or minimize adverse hydrologic effects or transmission of sediment into streams and other water bodies. This category is not applicable for deferred major storm damage repairs or major storm damage repairs performed solely to maintain vehicle traffic. Replacement of clear-span bridges and replacement of stream-crossing culverts with clear-span bridges is covered. (continued on next page) **Road Maintenance and Storm**	1. Dispose of slide and waste material in stable, non-floodplain sites approved by a geotechnical engineer or other qualified personnel. Use stable sites beyond floodplain within riparian areas only if an interdisciplinary process has identified the area as stable and not susceptible to delivery to the adjacent stream. Provide erosion control to minimize sediment delivery to streams. 2. Minimize disturbance of existing vegetation in ditches and at stream crossings to the greatest extent possible. 3. Minimize soil disturbance and displacement, but where sediment risks warrant, prevent off-site soil movement through use of filter materials (such as straw bales or silt fencing) if vegetation strips are not available. 4. Implement soil-disturbing maintenance activities during dry conditions to the greatest extent practical and follow ODFW Instream Work Guidelines (BA: Appendix C), where relevant, except where the potential for greater damage to water quality and fish habitat exists if the emergency road maintenance is not performed as soon as possible. 5. Follow NMFS' [*NOAA Fisheries'*] guidelines (BA: Appendix D) for replacement stream crossing design and installation. 6. Refuel power equipment, use absorbent pads for immobile equipment, and prepare concrete at least 150 feet (or as far as possible from the water body where local site conditions do not allow a 150 foot setback from water bodies) to prevent direct delivery of contaminants into associated water bodies. 7. Procurement of water used in dust abatement activities from pump chances would follow the PDCs of the Pump Chance Use programmatic category. 8. Where possible, take corrective actions to repair chronic problem areas such as sediment delivery or slope stability that have a potential to affect take of listed fish. 9. Ensure that all large wood is retained within the stream channel system during culvert cleaning activities. 10. Road maintenance activities (*e.g.*, grading, ditch cleaning, snow-plowing, etc.) would follow administrative unit Best Management Practices (BA: Appendix E). 11. Lead-based paint removal or removal of structures containing lead paints are not covered. 12. Design replacement stream crossings to pass a 100-year peak flood. Culverts shall pass the 100-year peak flood without exceeding the top of the culvert inlet (Headwater-to-Diameter Ratio less than one). Hydraulic capacity must compensate for expected deposition in the culvert bottom. 13. Limit replacement stream-crossing structures on fish-bearing streams to	NLAA: Actions, which would have a negligible effect or likelihood of adverse effect. For example, actions which may occur within riparian areas, but which would be unlikely to transmit sediment (including sand) or contaminants to streams. Also, vegetation manipulation, which would not affect stream channel shade, large woody material, or bank stability, etc., especially outside of the riparian area, may be NLAA. LAA: Actions, which have a reasonable likelihood of adverse effect. For example, nearly any action with substantial transmission of sediment (including sand) and turbidity to stream channels would be LAA, as would nearly any in-channel work. Vegetation manipulation within a riparian area would often, but would not invariably, be an LAA. Overall, a programmatically covered LAA road maintenance activity should result in a long-term reduction in the risk of road-generated turbidity, sediment, and /or channel extension to stream channels from existing road segments. <u>Consult on the activity individually if the activity exceeds the typical range of effects as described in Chapter 5 of the BA.</u>	For each FY, report total miles of LAA activities on FS and BLM roads by 5th field watershed.

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Proofing (continued)	one of the following options: a clear-span bridge, bottomless arch culvert, embedded culvert, or no-slope culvert. 14. Locate any new abutments or bents outside of the active stream channel. 15. Fresh concrete (cured less than 72 hours), concrete contaminated wastewater, welding slag and grindings, concrete saw cutting by-products, and sandblasting abrasives shall be contained and not come in contact with waterbodies or wetlands. 16. Stream-crossing structures shall not discharge stormwater runoff directly to streams. 17. Limit riprap use to scour protection of existing or replacement bridge structures and the replacement of pre-existing rock riprap. Riprap use will be minimized to the greatest extent possible and designed in consultation with a fish biologist or hydrologist. Outside of these uses riprap is not authorized. 18. Streambank stabilization shall use bioengineered solutions (*e.g.*, root wads, log toes, coir logs, woody and herbaceous plantings). A minimum amount of rock may be used for infrastructure (*e.g.*, road) protection when no alternative (*e.g.*, road realignment) exists, but bioengineered components shall be the dominant design feature. 19. Exception for bull trout: Does not include roadwork conducted between Sept 1 and April 30 within riparian areas in known bull trout spawning areas (BA: Appendix F).		

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Road Decommissioning and Obliteration This category includes the removal or stabilization of unnecessary, unstable, or poorly designed/constructed/located roads or portions of roads, with an overall goal of restoring hydrologic function. Actions such as bridge and culvert removal, removal of asphalt and gravel, subsoiling or ripping of road surfaces, outsloping, waterbarring, fill removal, sidecast pullback, revegetating with native species and placement of large woody material and/or boulders, and roadway barricading to exclude vehicular traffic are included.	1. A fisheries biologist and/or hydrologist should participate in the design and implementation of each LAA project. 2. Dispose of slide and waste material in stable, non-floodplain sites. Disposal of slide and waste material within existing road prism or adjacent hillslopes is acceptable to restore natural or near-natural contours, as approved by a geotechnical engineer or other qualified personnel. 3. Minimize disturbance of existing vegetation in ditches and at stream crossings to the extent necessary to restore the hydrologic function of the subject road. 4. Minimize soil disturbance and displacement, but where sediment risks warrant, prevent off-site soil movement through use of filter materials (such as straw bales or silt fencing) if vegetation strips are not available. 5. Maximize activities during late summer and early fall during dry conditions. 6. Follow ODFW Guidelines for Timing of In-Water Work (BA: Appendix C), where relevant, except where the potential for greater damage to water quality and fish habitat exists. Does not include work conducted between September and April 30 in known bull trout spawning areas (BA: Appendix F). Exceptions to ODFW guidelines for timing of in-water work must be requested and granted from the Services. 7. Refuel power equipment or use absorbent pads for immobile equipment at least 150 feet from water bodies to prevent direct delivery of contaminants into a water body, or as far as possible from the water body where local site conditions do not allow a 150-foot setback. 8. Develop and implement an approved spill containment plan that includes having a spill containment kit on-site located at previously identified containment locations.	NLAA: Activities within riparian areas that typically do not result in ground disturbance with sediment delivery mechanisms to stream channels. LAA: Activities within riparian areas that would likely result in ground disturbance with sediment delivery mechanisms to stream channels. Also, any in-stream work within or close proximity to listed fish species. <u>Consult on the action individually if the activity exceeds the typical range of effects as described in Chapter 5 of the BA.</u>	For each FY, report total miles of LAA activities on FS and BLM roads by 5th field watershed.

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Aquatic and Riparian Habitat Projects Aquatic habitat projects are generally completed to restore habitat conditions for fish and wildlife species. Restoration projects are generally done within the stream channel or adjacent floodplain to improve spawning, rearing or migration habitats. Project maintenance is also a significant component of each project. Vegetation objectives include increasing growth and survival of remaining conifers in riparian and upslope areas, with the ultimate intent of growing large trees for late-successional old-growth habitat and large woody debris for stream habitat. This category includes the placement of large wood (whole trees or portions of trees), boulders and gravel into the channel, construction and maintenance of riparian fences, excavation of side channels and alcoves, riparian silvicultural activities and stream bank and channel stabilization. Project access roads typically are rehabilitated with techniques that include seeding, waterbars, ripping and blocking. Passage improvements include the replacement of barrier culverts with passable structures; construction, maintenance, and cleaning of fish ladders and placement/construction of sills to improve access to culverts. Work may be accomplished using manual labor, heavy equipment or helicopters and may involve the use of this equipment in the stream channel. Includes site preparation (cutting hardwood trees and brush to create planting sites and/or openings), planting of seedlings, tubing and mountain beaver control, pruning, and precommercial thinning (young stand density management). Hand tools and chainsaws are usually used. (continued on next page)	1. Ensure that a professional fisheries biologist is involved in the design of all in-stream projects. Ensure that knowledgeable and trained personnel (*e.g.*, fisheries biologist, hydrologist, and/or engineer) are involved in the implementation of all in-stream projects. 2. Follow ODFW guidelines for timing of in-water work (BA: Appendix C), where relevant, except where the potential for greater damage to fish, water quality, and fish habitat exists. Does not include work conducted between September and April 30 in known bull trout spawning areas (BA: Appendix F). Exceptions to ODFW guidelines for timing of inwater work must be requested and granted from the Services. 3. Stabilize potential erosion areas and control sedimentation. Minimize sedimentation potential by implementing appropriate measures to meet Oregon DEQ turbidity standards. 4. Rehabilitate and stabilize all disturbed areas by seeding & planting with native seed mixes or plants or otherwise compatible species. 5. Minimize the number and length of access points through riparian areas. 6. Heavy equipment should be cleaned and free of leaks before used in the stream channel. Minimize the amount of time that heavy equipment is in the stream channel. Do not store equipment in stream channels when not in use to avoid effects of vandals, accidents, or natural disasters. 7. Develop and implement an approved spill containment plan that includes having a spill containment kit on-site, located at previously identified containment locations. Refuel equipment (including chain saws and other hand power tools) at least 150 feet from water bodies to prevent direct delivery of contaminants into a water body or as far as possible from the water body where local site conditions do not allow a 150-foot setback. 8. Use whole trees and/or tree pieces with attached roots (if available) of sufficient size (*i.e.*, some are key pieces) and aggregated in a manner to most closely mimic natural accumulations of large woody debris for that particular stream type. Use cable in project design sparingly and only when conditions do not exist to anchor large wood naturally between riparian trees or where stream power is great enough that wood meeting size criteria cannot be stabilized through natural anchoring. Favor use of bioengineering techniques. 9. Do not fall conifers in riparian area for restoration purposes unless conifers are fully stocked or if necessary (*i.e.*, no other practical alternative) for safety. If necessary for safety, fall trees toward the stream and leave in place, or place within the stream channel or floodplain at the site. 10. Place large boulders in streams where they occur naturally as a habitat component. Boulder placement is for stream habitat restoration, not bank stabilization. 11. When replacing culverts, follow NMFS' [*NOAA Fisheries'*] guidelines for design and installation (BA: Appendix D). 12. Limit replacement stream-crossing structures on fish-bearing streams to	NLAA: Actions in which the wetted stream channel or water body is not entered when listed species are present, which do not transmit turbidity to areas where listed species or spawning habitat are present, are unlikely to transmit disturbed soil to water bodies, and would not disturb a substantial amount of woody vegetation in riparian areas. Examples might include fence construction and tree planting. Also may include in-channel work above or below listed species presence in some situations. LAA: Nearly any action in which the wetted stream channel or water body is entered when listed species are present or turbidity is transmitted to such areas or to areas suitable for spawning, where disturbed soil is likely transmitted to water bodies, and which would disturb substantial amounts of woody vegetation in the riparian area. <u>Consult on the activity individually if the activity exceeds the typical range of effects as described in Chapter 5 of the BA .</u>	For each FY, estimate the total LAA miles of stream treated, LAA acres of riparian area treated, number of LAA fish passage culverts replaced, and number of LAA culverts replaced in nonfish-bearing streams to accommodate a 1 in 100 year flood event within watersheds.

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Aquatic and Riparian Habitat Projects (continued) Stands are trees typically between 2-8 inch dbh. Individual openings for riparian restoration are 1 acre or less and are scattered through the riparian area. Carcass enrichment projects, which attempt restoration of historic stream and riparian nutrient conditions are included, as are inchannel site preparation for smolt trap operations. Bull Trout Exception: the Action Agencies shall inform USFWS of proposed Aquatic and Riparian Habitat Projects in known bull trout spawning areas through regular Level 1 Team meetings.	one of the following options: a clear-span bridge, bottomless arch culvert, embedded culvert, or no-slope culvert. 13. Design stream-crossings to pass the 100-year peak flood. Culverts shall pass the 100-year peak flood without exceeding the top of the culvert inlet (Headwater-to-Diameter Ratio less than one). Hydraulic capacity must compensate for expected deposition in the culvert bottom. 14. Locate any new abutments or bents outside of the active stream channel. 15. Fresh concrete (cured less than 72 hours), concrete contaminated wastewater, welding slag and grindings, concrete saw cutting by-products, and sandblasting abrasives shall be contained and not come in contact with waterbodies or wetlands. 16. Stream-crossing structures shall not discharge stormwater runoff directly to streams. 17. Develop projects within a watershed context (for example, they are consistent with a Watershed Analysis or watershed plan). 18. Carcass enrichment projects use carcasses from the treated watershed, or are certified disease free by an ODFW pathologist. Projects are permitted through ODEQ.		

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Recreation Site, Trail, and Administrative Structure and Maintenance and Associated Public Use This category includes providing access to and use of public recreational facilities (at campgrounds, picnic areas, trails, boat ramps, etc.), including safety and property damage reduction. Also includes tree hazard management along Federal roads used for recreation. Program activities consist of tree hazard management (at developed and dispersed recreation facilities, along roads and trails, at rights-of-way, and for adjacent non-Federal land), facility maintenance, repair, and upgrade; trail maintenance, off-highway vehicle trail maintenance, repair, and upgrade (including that of stream crossings; typically using hand tools, hand power tools, small motorized equipment), brushing, tread work, minor realignment, and removal of downed trees from a trail. Does not include new trail construction.	1. Follow ODFW Guidelines for Timing of In-Water Work (BA: Appendix C), where relevant, except where the potential for greater damage to fish, water quality, and fish habitat exists. Does not include work conducted between September 1 and April 30 in known bull trout spawning areas (BA: Appendix F). Exceptions to ODFW guidelines for timing of in-water work must be requested and granted from the Services. 2. Minimize adverse effects of brushing (*e.g.*, loss of shade, bank stability, etc.) when trails or facilities occur within riparian areas by leaving as much of an uncut buffer as possible (*i.e.*, usually at least a 10 foot buffer along intermittent and ephemeral streams, and a 20 foot buffer along perennial streams). 3. Consider relocating mobile infrastructure away from potential hazard trees. Where relocation is not feasible, consider limbing or topping to alleviate the potential hazard. Where falling is deemed necessary, directionally fall trees toward stream channels and riparian areas and leave the tree on site where it is safe and feasible to do so. 4. Do not remove down wood from sites (except to clear trails) in riparian areas unless fisheries personnel determine that large woody material objectives for stream and riparian areas in the proposed project area are met (as defined by Watershed Analysis and/or NFP Record of Decision Standards and Guidelines). Take steps to prevent firewood gathering and theft within riparian areas. 5. For downed logs within trail tread located in riparian areas, retain the maximum feasible length. 6. Prevent and minimize erosion from trails by designing and maintaining proper drainage structures with adequate spacing of waterbars especially before stream crossings. 7. Dispose of small (<3 cubic meters) slide and slump materials in stable areas and away from stream channels. 8. Refuel power equipment at least 150-feet from water bodies to prevent direct delivery of contaminants into a water body, or as far as possible from the water body where local site conditions do not allow a 150 foot setback. 9. Control developed site user activities affecting riparian vegetation or in-stream habitat that may lead to incidental take of listed proposed and/or listed species, including localized access closures where needed. 10. Bull trout exceptions: In known areas of bull trout spawning habitat: a. Distribute or post educational materials regarding bull trout requirements and habitat management, and b. Close and rehabilitate roads and sites where use is degrading known bull trout spawning habitat	NLAA: Actions which would not transmit effects to stream channels and other water bodies where listed species are present, and would not disturb a substantial amount of woody vegetation in the riparian area of water bodies, and would not decrease stream shade, large woody material supply, or bank stability. LAA: Nearly any action, which would transmit effects to stream channels or other water bodies, including sediment, would decrease stream shade, large woody material, or bank stability; or would disturb substantial woody vegetation in the riparian area. Facilities that may result in incidental harassment of fish are included. Effects should be short-term and/or localized. <u>Consult on the action individually if the activity exceeds the typical range of effects as described in Chapter 5 of the BA.</u>	For each FY, estimate the total miles of LAA trail maintenance and acres of LAA recreation and administration sites maintained or used by 5th field watershed.

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Fisheries, Wildlife, Botany, and Cultural Programs (Including Near Stream and In-stream Surveys) This category includes assessing and monitoring aquatic and riparian habitat conditions; assessing and monitoring individuals and communities of vertebrate, invertebrate and botanical species; assessing cultural and historic resources; and educating the public about aquatic and riparian resources/values. Program activities consist of: Aquatic habitat inventories; spawning surveys; snorkeling surveys; aquatic macroinvertebrate collecting; riparian vegetation surveys; wildlife surveys; water quality monitoring; cultural resource assessments (including excavating test pits <1m^2 in size); and supervised school and public education (including Salmon Watch and Cascade Streamwatch) activities. Note: Any activities that involve "direct" take of a species should be covered under Section 10 permits (*i.e.*, hook and line, netting, trapping, seining, electrofishing, etc.). However, surveys oriented towards observing fish presence and occupancy (*i.e.*, spawning surveys and snorkeling) involve take that is incidental to the purpose of the activity, hence, can be covered under Section 7.	1. Minimize amount of disturbance to fish by training personnel in survey methods that prevent or minimize disturbance of fish. Contract specifications should include these measures where appropriate. 2. Avoid impacts to fish redds. When possible, avoid sampling during spawning periods. 3. Avoid in-stream, non-bull trout surveys in known bull trout spawning areas (BA: Appendix F) from September 1 through April 30 (bull trout spawning and incubation season). 4. Coordinate with other local agencies to prevent redundant surveys. 5. Locate excavated material from cultural resource test pits away from stream channels. Replace all material in test pits when survey is completed and stabilize the surface. 6. Use multiple stream sites for informational field trips to minimize effects on any given stream or riparian area.	NLAA: Activities which typically do not result in ground disturbance where sediment delivery mechanisms to stream channels do not exist, and would not disturb a substantial amount of woody vegetation within riparian areas, and would not decrease stream shade, large woody material supply or bank stability. LAA: Activity typically involves sampling, observation, and assessment in direct or close proximity to fish species and their habitat. This can result in temporary disturbance of individual ESA-listed fish, but does not involve the deliberate take of these species (electrofishing or smolt trapping, for example)*. Activity does not adversely modify or destroy habitat. Activities may result in the incidental take of individual fish but would not be expected to adversely affect fish populations at the local level (6th or 7th field watershed) *Deliberate take of an ESA-listed species for which take is prohibited requires a Section 10 (a)(1)(A) permit, and is not authorized by this or any other Section 7 consultation. Consult on the action individually if the activity exceeds the typical range of effects as described in Chapter 5 of the BA.	For each FY, estimate the total LAA stream mileage surveyed and inventoried within each 5th field watershed.

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Pump Chance/Helipond Maintenance Use This category includes maintenance and use of pump chances and heliponds to support fire suppression and dust abatement activities. Access routes to pump chances are maintained by removing vegetation from trails to pumper trucks and/or helicopter access points, removing trees from helicopter loading sites and the installation of boulders (or similar) to increase pool depth. Also included is dredging of heliponds to improve water storage capacity; and installation of drain pipes, riprap and liners on ponds. Withdrawals from streams and ponds may be used for many activities (*e.g.*, fire control, dust abatement, compacting roads, etc.). Water for fire control is typically not withdrawn every year. Note: Wildfire suppression-related activities are covered separately under National Fire Plan Consultation Procedures.	1. Dispose of slide and waste material in stable, non-floodplain sites approved by a geotechnical engineer or other qualified personnel. Use stable sites beyond floodplain within riparian area only if an interdisciplinary team has identified the area as stable and not susceptible to delivery of sediment to the adjacent stream. Use sediment control measures such as straw bales, filter cloth, or sediment fences when conditions warrant their use. 2. Minimize disturbance of existing riparian vegetation to the greatest extent practical; in particular, maintain shade, bank stability, and large woody material recruitment potential. 3. Maximize maintenance activities during late summer and early fall to best avoid wet conditions. 4. Follow ODFW Instream Work Guidelines (BA: Appendix C), where relevant, except where the potential for greater damage to water quality and fish habitat exists. 5. Do not pump from streams that do not have continuous surface flow. 6. When pumping water in all situations from streams, ensure that at least one-half the original streamflow volume remains below the pump site. 7. Refuel power equipment, or use absorbent pads for immobile equipment at least 150 feet distant from water bodies to prevent direct delivery of contaminants into a water body or as far as possible from the water body where local site conditions do not allow a 150-foot setback. 8. Fisheries, hydrology or other qualified personnel shall work with engineering/fire personnel to review proposed activities to minimize potential effects to stream channel conditions and water quality. 9. Encourage decommissioning of unnecessary stream pump chances as well as switching toward the use of off-channel ponds. 10. As appropriate, water withdrawal with fish present must have a fish screen installed, operated and maintained in accordance with NMFS' [*NOAA Fisheries'*] current fish screen criteria (BA: Appendix G).	NLAA: Activities, which typically do not result in ground disturbance with sediment delivery mechanisms to stream channels. Would not decrease stream shade, large woody material supply or bank stability. Pumping maintains a continuous surface flow and the original wetted width of the stream and there is negligible risk of incidental take caused by pump entrainment/screen impingement. LAA: Activity typically results in ground disturbance that creates a potential sediment source with delivery mechanism. Water withdrawal may result in occasional entrainment/impingement/strandin g of fish. Deepening of pools in fish-bearing streams could be accomplished through installation of (fish-passable) boulder or cobble weirs, but not excavation. Overall, activity should not retard long-term growth and survival of vegetative species that are important to maintaining and creating fish habitat within the riparian area. <u>Consult on the action individually if the activity exceeds the typical range of effects as described in Chapter 5 of the BA.</u>	For each FY, total number of activities at LAA sites that were maintained or used by 5th field watershed.

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Rock Quarry Operations This category includes the use of rock and gravel for road construction and maintenance and for other activities such as restoration projects. Program includes activities within existing quarry boundaries including restoration, drilling, blasting, crushing, sorting, loading, hauling on new or existing roads, and stockpiling material from decommissioned roads.	1. For quarries that occur within riparian areas, allow activities with the potential to introduce sediment into streams only during the dry season (usually May 15 to October 15). If unusual circumstances (*e.g.*, emergency road repair) require such activities outside of the dry season, require all necessary BMPs and other mitigation measures to prevent sediment movement into streams, and, if appropriate, initiate emergency consultation. 2. Avoid activities during wet periods, whether in the dry or wet season, that have the potential to generate and deliver sediment to streams. 3. Minimize sedimenation potential by implementing appropriate measures to meet ODEQ turbidity standards. 4. Include erosion control plans in pit operation plans for quarries to protect water quality, stream channels and fish.	NLAA: Actions that typically do not result in ground disturbance with sediment and/or contaminant delivery mechanisms to stream channels. Example: usually, dry season operation. Quarry operations would not decrease stream shade, large woody material supply, channel complexity, or bank stability and would occur outside of wetted stream channel. LAA: Actions that likely result in sediment and/or contaminant delivery mechanisms to stream channels. Effects would be minor and short-term. Example: often, wet season operation. <u>Consult on the action individually if the activity exceeds the typical range of effects as described in Chapter 5 of the BA.</u>	For each FY, report by 5th field watershed the total number of active LAA quarries.

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Non-Commercial Vegetation Treatments This category includes the use of manual or light powered equipment (*i.e.*, does not include the use of bulldozers, excavators, etc.), and silviculture through the reduction of competition/predation and collection of plant material; to prevent and control the spread of non-native vegetation; and to enhance habitat for native vegetation and/or wildlife. Program activities consist of preparing planting sites (typically using chainsaws, machetes and other similar hand or power tools); controlling brush and pruning using hand and power tools; pre-commercial thinning of young trees; controlling animal damage by trapping, tubing, rodent baiting, or other manual method (excluding beaver C. canadensis); planting trees and other desired vegetation; collecting cones, seedlings, etc.; fertilization; mulching; meadow mowing and tree topping, girdling, etc. to enhance wildlife habitat; and prescription burning outside of riparian areas. Prescription burns for timber sales will be covered under timber sale individual project consultations. Does not include use of herbicides.	1. Maintain an untreated or modified treatment area within 10 feet along ephemeral and non-fish bearing intermittent streams, and a 20 foot untreated buffer on perennial streams, to prevent any potential adverse affects to stream channel or water quality conditions. 2. Fisheries, hydrology or other qualified personnel shall review proposed activities to define the affected areas. 3. During project design, develop appropriate measures to ensure protection of aquatic and riparian habitats. 4. Refuel power equipment, or use absorbent pads for immobile equipment, at least 150 feet distant from water bodies, to prevent direct delivery of contaminants into a water body, or as far as possible from the water body where local site conditions do not allow a 150-foot setback. 5. Do not apply chemical fertilizer within 50' of live water. For carcass enrichment projects refer to the PDCs for Aquatic Riparian Habitat projects.	NLAA: Activities which typically do not result in ground disturbance where sediment delivery mechanisms to stream channels do not exist, and would not disturb a substantial amount of woody vegetation within riparian areas, and would not decrease stream shade, large woody material supply or bank stability. Pre-commercial thinning and prescription burning with negligible effect on hydrologic recovery on project scale. LAA: Activity typically results in ground disturbance that creates a potential sediment source or would disturb a substantial amount of woody vegetation within riparian areas, or would decrease stream shade, large woody material supply or bank stability. Overall, activity should not retard long-term growth and survival of vegetative species that are important to maintaining and creating fish habitat within riparian areas. Pre-commercial thinning and prescription burning with more than a negligible effect on hydrologic recovery on project scale, but with minor effects on peak flows. **Intentional prescription burning within riparian areas and actions with more than minor effects on peak flows is not covered under this programmatic consultation.** Consult on the action individually if the activity exceeds the typical range of effects as described in Chapter 5 of the BA.	For each FY, estimate the total LAA acres by 5th field watershed of non-commercial vegetation treatment.

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Miscellaneous Special Use Permits and Leases This category allows miscellaneous designated activities on Federal land. Program activities include permits for (but not limited to): group recreation, outfitters and guides (including surface water recreating), use of Federally owned structures, resort operation on Federal land, and summer home/recreational residence maintenance and administration. Special use permits are issued to members of the public to allow and track activities otherwise not permitted/monitored. The Federal analysis of effects should include an analysis of the effects of interrelated and interdependent activities which the permits enable on non-Federal land.	1. Prior to issuance of a special use permit, a fisheries biologist shall make a written evaluation of the proposed action and any interrelated and interdependent effects of the action. Consult individually if effects of action are reasonably likely to take individuals of listed fish species or adversely affect habitat in riparian areas beyond those effects described in Chapter 5 of the BA. 2. Special Use Permits for surface water recreating shall designate launch and take-out locations; avoid disturbance of adult fish; apply resource protection clauses that maintain habitat and minimize sedimentation and accidental capture/harm to bull trout; and where appropriate include educational materials describing bull trout identification and habitat requirements annually with issuance of special use permits.	NLAA: Action and interrelated and interdependent actions in riparian areas that are unlikely to transmit sediment to stream channel and would not reduce potential large woody material recruitment. Other habitat indicators would not be adversely affected. LAA: Permits for surface water recreating are covered; all other programs must be consulted upon individually.	For each FY, report the number of surface water recreating permits issued by 5th field watershed.

Program & Description	Project Design Criteria	Typical Effects and Determination	Reporting Requirements
Telephone Line and Power Line Renewal Special Use Permits/Right-of-Way Grants This category includes vegetation, road, and pole maintenance associated with the renewal of telephone lines and non-Federal Energy Regulatory Commission-related powerline special use permits. Permitted road maintenance only applies to non-system spur roads needed to access lines. Vegetative maintenance activities consist of brushing understory vegetation, tree limbing, chipping slash, and falling of hazard trees underneath or along telephone line and powerline corridors. Road maintenance consists of actions which are similar to those described under that programmatic category. Pole maintenance includes repair and replacement of damaged and downed poles and lines. Equipment (backhoes and trucks) are needed to carry, straighten and dig footings for poles. This activity does not include use of herbicides. The Federal analysis of effects should include an analysis of the effects of interrelated/interdependent activities that Federal permits enable on non-Federal land.	1. Apply applicable PDCs from Road Maintenance programmatic category. 2. Protect streams to the greatest extent possible from raw concrete, concrete dust, and wash water. Prepare concrete a minimum of 150 feet from all water bodies. 3. Minimize brushing in riparian areas by leaving a minimum 10 foot buffer along intermittent and ephemeral streams, and a minimum 20 foot buffer along perennial streams. 4. Directionally fell hazard trees toward streams and riparian areas where it is safe and feasible to do so. 5. Do not remove hazard or blowdown trees in riparian areas. If blowdown trees in riparian areas need to be cut, keep lengths as long as possible.	NLAA: Action and i/i actions in riparian areas that are unlikely to transmit sediment to stream channels and would not reduce potential large woody material recruitment. Other habitat indicators would not be adversely affected. Vegetation manipulation which would not affect stream channel shade, large woody material, or bank stability, etc., especially outside of riparian areas, may be NLAA. LAA: Actions, which have a reasonable likelihood of adverse effect. For example, actions that could transmit sediment and/or turbidity to stream channels would be an LAA, as would nearly any in-channel work. Vegetation manipulation within riparian areas would often, but not invariably, be an LAA. Effects should be short-term and localized. Vegetative treatments that retard long-term growth and survival of riparian vegetation important for stream habitat should be consulted on individually. Consult on the action individually if the activity exceeds the typical range of effects as described in Chapter 5 of the BA.	For each FY, report by 5th field watershed the number of LAA permits renewed.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

NOAA Fisheries listed OC coho salmon as threatened under the ESA on August 10, 1998 (63 FR 42587), LCR steelhead as threatened on March 19, 1998 (63 FR 13347), UWR and MCR steelhead as threatened on March 25, 1999 (64 FR 14517), LCR and UWR chinook salmon as threatened on March 24, 1999 (64 FR 14308), and CR chum salmon as threatened on March 25, 1999 (64 FR 14508). NOAA Fisheries issued protective regulations for each of these evolutionarily significant units (ESUs) under section 4(d) of the ESA on July 10, 2000 (65 FR 42423). NOAA Fisheries proposed OC steelhead as threatened under the ESA on August 9,1996 (61 FR 41541), but found the species not warranted for listing on March 19, 1998 (63 FR 13347). NOAA Fisheries found LCSW coho salmon were not warranted for listing on July 25, 1995 (60 FR 38011). OC steelhead and LCSW coho salmon are currently candidate species.

Because of the candidate status of OC steelhead and LCSW coho salmon, NOAA Fisheries has considered the FS and BLM's effects determinations for these species simultaneously with the other currently listed ESUs considered in this consultation. NOAA Fisheries applies a habitat-based jeopardy analysis, and assumes land management actions have similar effects upon each of these anadromous species because similar aquatic habitat conditions are necessary for survival and recovery of each ESU. If OC steelhead and/ or LCSW coho salmon are listed under the ESA in the future, NOAA Fisheries expects that this Opinion will be the basis of a biological opinion for the 10 programmatic activity categories covered in this consultation.

The objective of this Opinion is to determine whether the 10 programmatic categories proposed by the FS and BLM within the Lower Columbia, Willamette, and Oregon Coast provinces and a small portion of the Deschutes River province are likely to jeopardize the continued existence of LCR, UWR, and MCR steelhead; LCR and UWR chinook salmon; OC coho salmon; and CR chum salmon (Figure 1).

2.1.1 Biological Information

The listing status and history, and sources of biological information and population trends for each ESU addressed in this Opinion are summarized in Table 3. Essential elements of anadromous salmonid habitat are: (1) Substrate; (2) water quality; (3) water quantity; (4) water temperature; (5) water velocity; (6) cover/shelter; (7) food (juvenile only); (8) riparian vegetation; (9) space; and (10) safe passage conditions. Based on migratory and other life history timing, it is likely that adult and/or juvenile life stages of the 9 subject ESUs would be present in the action area when activities within some of the 10 programmatic categories addressed in this Opinion would be carried out. The effects of each individual action will vary in timing, duration, and intensity.

Table 3. References for additional background information on listing status, protective regulations, and biological information for the listed and candidate species considered in this Opinion.

Species	Listing Status	Protective Regulations	Biological Information, Population Trends
Oregon Coast coho salmon	August 10, 1998 63 FR 42587 Threatened	July 10, 2000 65 FR 42423	Weitkamp *et al*. 1995; Nickelson *et al*. 1992; NOAA Fisheries 1997; Sandercock 1991
Lower Columbia River steelhead	March 19, 1998 63 FR 13347 Threatened	July 10, 2000, 65 FR 42422	Busby *et al*. 1995; Busby *et al*. 1996; ODFW and WDFW 1998
Upper Willamette River steelhead	March 25, 1999 64 FR 14517 Threatened	July 10, 2000, 65 FR 42422	Busby *et al*. 1995; Busby *et al*. 1996; ODFW and WDFW 1998
Middle Columbia River steelhead	March 25, 1999 64 FR 14517 Threatened	July 10, 2000, 65 FR 42422	Busby *et al*. 1995; Busby *et al*. 1996; ODFW and WDFW 1998
Lower Columbia River chinook salmon	March 24, 1999 64 FR 14308 Threatened	July 10, 2000, 65 FR 42422	Myers et a. 1998; Healey 1991; ODFW and WDFW 1998
Upper Willamette River chinook salmon	March 24, 1999 64 FR 14308 Threatened	July 10, 2000, 65 FR 42422	Myers et a. 1998; Healey 1991; ODFW and WDFW 1998
Columbia River chum salmon	March 25, 1999 64 FR 14508 Threatened	July 10, 2000, 65 FR 42422	Johnson *et al*. 1997; Salo 1991; ODFW and WDFW 1998
Oregon Coast steelhead	March 19, 1998, 63 FR 13347 Not Warranted	--	Busby *et al.* 1996.
Lower Columbia/ Southwest Washington coho salmon	July 25, 1995 60 FR 38011 Not Warranted	–	Weitkamp *et al*. 1995

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of: (1) Defining the

biological requirements of the listed species; and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed species' life stages that occur beyond the action area. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, it must identify reasonable and prudent alternatives for the action.

NOAA Fisheries also evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' critical habitat. NOAA Fisheries must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. NOAA Fisheries identifies those effects of the action that impair the function of any essential element of critical habitat. NOAA Fisheries then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NOAA Fisheries concludes that the action will adversely modify critical habitat, it must identify any reasonable and prudent alternatives available.

For the proposed action, NOAA Fisheries' jeopardy analysis considers direct or indirect mortality of fish attributable to the action. Because critical habitat is not currently designated for the subject ESUs in this Opinion, NOAA Fisheries did not include a critical habitat analysis.

2.1.2.1 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for listed Pacific salmon to survive and recover to naturally reproducing population levels at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment. Essential habitat features for survival and recovery of Pacific salmon include: (1) Substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food (juvenile only), (8) riparian vegetation, (9) space, and (10) safe passage conditions.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful adult and juvenile migration, adult holding, spawning, egg incubation, and rearing. The current status of the subject ESUs, based on their risk of extinction, has not significantly improved since the species were listed and, in some cases, their status may have worsened.

2.1.2.2 Environmental Baseline

In step 2 of NOAA Fisheries' analysis, we evaluate the relevance of the environmental baseline in the action area to the species' current status. The environmental baseline is an analysis of the effects of past and ongoing human-caused and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. The action area is defined by NOAA Fisheries regulations (50 CFR 402) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the purposes of this consultation, the action area includes Federal lands administered by the Federal action agencies, or non-federal lands affected by the proposed programmatic actions, in basins within the Oregon Coast, Willamette Valley, and Lower Columbia River provinces as well as that portion of the MCR steelhead ESU within the Mt. Hood National Forest and the Oregon portion of the Columbia River Gorge National Scenic Area (Figure 1). The programmatic actions covered in this Opinion occur in 16 fourth-field basins: Clackamas, Sandy, Middle Columbia/Hood River, Nehalem, Siletz/Yaquina, Alsea, Siuslaw, Siltcoos, Tualatin, Yamhill, Molalla, North Santiam, South Santiam, McKenzie, Middle Fork Willamette, and Coast Fork Willamette.

NOAA Fisheries (1996a) can be used to characterize the environmental baseline in terms of instream, riparian, and watershed elements that reflect geologic and climatic conditions in the action area. The Level 1 Team used procedures in NOAA Fisheries (1996) to characterize the environmental baseline for 100 of the total of 135 fifth-field watersheds in the action area where the appropriate data were available (Figure 2). However, due to the large number of fifth-field watersheds included in this consultation (135), a sub-sample of 27 were selected for intensive analysis (see Analysis of Effects). A summary of environmental baseline conditions, based on the habitat indicators in NOAA Fisheries (1996), is presented in Table 4. The remainder of the fifth-field environmental baseline summaries can be found in Appendix B of the BA.

Figure 2. Baseline condition of watersheds covered by the subject consultation (taken from page 18 of BA).

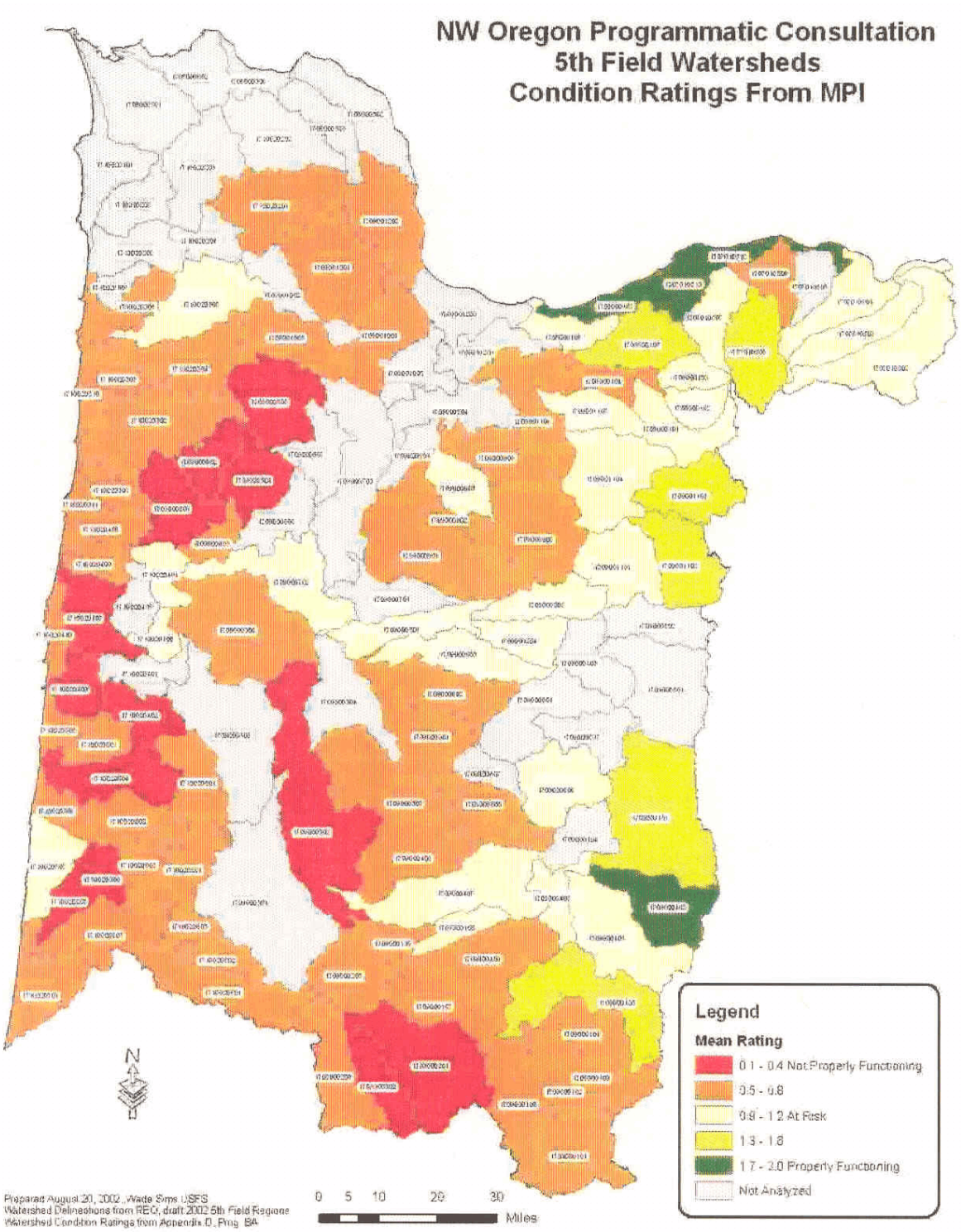


Table 4. Summary of habitat indicator environmental baseline conditions for 27 5th field watersheds within the action area.

Habitat Indicator	Properly Functioning	At Risk	Not Properly Functioning
Water Quality			
Temperature	CGE, MEFH, OGF, UCR, LMcK, HC, SSR, UMcK	FC, SRLC, LNSR, CTM, SDC, LC, SFMR, UMFW	DC, UA, WC, UMR, BEY, NR, WST, LCLMFW, MC, US, DCA
Sediment/Turbidity	CGE, MEFH, UCR, UA, HC	SRLC, LNSR, WC, UMR, CTM, SDC, NR, LC, LCLMFW, LMR, MC, US, SFMR, SSR, UMcK, DCA	FC, OGF, DC, BEY, WST, UMFW
Chemical Concentrations/ Nutrients	CGE, MEFH, OGF, UCR, UA, LC, HC, SFMR, SSR, UMcK, UMFW	FC, SRLC, LNSR, UMR, SDC, NR, WST, LMR,MC, US, DCA	DC, WC, BEY
Access			
Physical Barriers	FC, SRLC, OGF, LNSR, UMR, HC	CGE, MEFH, UCR, LC, LCLMFW, LMR, UMFW	DC, UA, WC, BEY, NR, WST, MC, US, SFMR, SSR, UMcK, DCA
Habitat Elements			
Substrate/Sediment	CGE, FC, SRLC, OGF, UCR, DC, LNSR, UMR, HC, UMcK	MEFH, UA, CTM, SDC, LC, LCLMFW, LMR, US, SFMR, SSR, DCA	WC, BEY, NR,WST, MC, UMFW
Large Woody Debris	CGE, FC, CTM	MEFH, SRLC, OGF, UCR, HC, SFMR, SSR, UMcK	DC, LNSR, UA, WC, UMR, BEY, SDC, NR,WST, LC, LCLMFW, LMR, MC, US, UMFW, DCA
Pool Frequency	CGE, OGF, NR, WST, HC	DC, UA, WC, CTM, SDC, LC, LCLMFW, LMR, US, SFMR, UMcK, DCA	MEFH, FC, SRLC, UCR, LNSR, UMR, BEY, MC, SSR,UMFW
Pool Character and Quality	CGE, OGF, UCR, LNSR, HC	MEFH, FC, SRLC, DC, WC, UMR, BEY, CTM, NR, WST, LC, US, SFMR, UMcK, DCA	UA, SDC, LCLMFW, LMR, MC, SSR, UMFW
Refugia	CGE, OGF, UCR, UA, HC, SSR	MEFH, FC, SRLC, DC, WC, CTM, NR, LC, LMR, US, UMFW, DCA	BEY, SDC, LCLMFW, MC, SFMR
Off Channel Habitat	CGE, MEFH, FC, OGF, LNSR, UMR, HC, SSR	UCR, DC, UA, CTM, WST, LCLMFW, SFMR, UMcK, UMFW, DCA	SRLC, WC, BEY, SDC, NR, LC, LMR, MC, US

Habitat Indicator	Properly Functioning	At Risk	Not Properly Functioning
Channel Condition and Dynamics			
Width/Depth Ratio	CGE, MEFH, HC, UMcK	FC, SRLC, LC, LCLMFW, LMR, MC, SFMR, SSR, UMFW	OGF, UCR, LNSR, UMR, WST, US
Streambank Condition	CGE, MEFH, SRLC, OGF, UA, HC, SFMR, UMcK	UCR, UMR, CTM, NR, LC, LCLMFW, LMR, MC, US, SSR, UMFW, DCA	FC, DC, LNSR, WC, BEY, WST
Floodplain Connectivity	CGE,HC	MEFH, FC, SRLC, OGF, UCR, DC, UMR, CTM, NR, LC, LMR, SFMR, UMck, UMFW, DCA	UA, WC, BEY, WST, LCLMFW, MC, US, SSR
Flow/Hydrology			
Changes in Peak/Base Flows	CGE, HC	FC, SRLC, UCR, LC, LMR, US, SFMR, UMcK	MEFH, OGF, LNSR, UMR, LCLMFW, MC, UMFW
Increase in Drainage Network	CGE,	MEFH, FC, SRLC, UCR, LNSR, LC, MC, HC, SFMR, UMcK	OGF, UMR, LCLMFW, LMR, US, SSR, UMFW
Watershed Conditions			
Road Density and Location		CGE, MEFH, SRLC, LNSR, BEY, CTM, WST, HC, UMcK, DCA	FC, OGF, UCR, DC, UA, WC, UMR, SDF, NR, LC, LCLMFW, LMR, MC, US, SFMR, SSR, UMFW
Disturbance History	CGE, UCR, HC	MEFH, FC, SRLC, LNSR, UMR, CTM, LC, LMR, SFMR, UMcK, UMFW	OGF, DC, UA, WC, BEY, SDF, NR, WST, LCLMFW, MC, US, DCA
Riparian Reserves	CGE, UA	FC, SRLC, OGF, UCR, LNSR, HC, SFMR, UMcK	MEFH, DC, WC, UMR, BEY, CTM, SDF, NR, WST, LC, LCLMFW, LMR, MC, US, SSR, UMFW, DCA
OVERALL WATERSHED CONDITION RATING	CGE, HC	MEFH, FC, SRLC, OGF, UCR, LNSR, CTM, SDC, WST, LC, SFMR, SSR, UMcK, DCA	DC, UA, WC, UMR, BEY, NR, LCLMFW, LMR, MC, US, UMFW

BEY (Big Elk Creek of Yaquina), **CGE** (Columbia Gorge East), **CTM** (Cummins/Tenmile/Mercer Lake Frontal), **DC** (Dairy Creek of Tualatin), **DCA** (Drift Creek of Alsea), **FC** (Fifteenmile Creek), **HC** (Horse Creek of McKenzie), **LC** (Lake Creek of Siuslaw), **LCLMFW** (Lost Creek/Lower Middle Fork Willamette), **LMcK** (Lower McKenzie River), **LNSR** (Little North Fork Santiam River), **MC** (Mosby Creek of Coast Fork Willamette), **MEFH** (Middle/East Fork Hood River), **NR** (Nestucca River), **OGF** (Oak Grove Fork of Clackamas), **SDC** (Schooner/Drift Creek of Siletz Bay), **SFMR** (South Fork McKenzie River), **SRLC** (Salmon River of Lower Columbia), **SSR** (South Santiam River), **UA** (Upper Alsea), **UCR** (Upper Clackamas River), **UMcK** (Upper McKenzie River), **UMFW** (Upper Middle Fork Willamette), **UMR** (Upper Molalla River), **US** (Upper Siuslaw), **WC** (Willamina Creek), **WST** (Woahink/Siltcoos/Tahkenitch Frontal).

As noted above, the action area includes all areas directly or indirectly affected by the proposed action. The general action area for this Opinion can be defined as all 135 5th field watersheds in which the proposed actions would occur. OC and LCSW coho salmon; LCR, UWR, MCR, and OC steelhead trout; LCR and UWR chinook salmon; and CR chum salmon use the watersheds within the action area as habitat for rearing, feeding, spawning, incubation habitat, and migration. The environmental baseline of the action areas is dominated by conditions rated as functioning at risk or not properly functioning (see Table 4 above, and watershed MPI's in BA). These conditions are likely the result of past land management activities.

Based on the best information available on the current status of OC and LCSW coho salmon; LCR, UWR, MCR, and OC steelhead trout; LCR and UWR chinook salmon; and CR chum salmon, and NOAA Fisheries' assumptions given the information available regarding population status, population trends, and the poor environmental baseline conditions within the action area, the environmental baseline does not currently meet all of the biological requirements for the identified ESUs. Actions that promote or do not retard attainment of properly functioning aquatic conditions, when added to the environmental baseline, are necessary to meet the needs of the species (survival and recovery for listed fish).

2.1.3 Analysis of Effects

2.1.3.1 Effects of Proposed Action

In the jeopardy analysis, NOAA Fisheries evaluates the effects of the proposed actions on listed Pacific salmon.

The Level 1 Team reviewed the categories of programmatic actions and developed additional PDCs to further minimize the likelihood of adverse effects to LCR, UWR, and MCR steelhead; LCR and UWR chinook salmon; OC coho salmon; and CR chum salmon. In the BA, the FS and BLM described the typical range of effects ("Effects Common to the Activity Categories"; BA pp. 58-95) of each activity category when PDCs described in the BA are followed. The BA summarizes the habitat indicators that could be affected (positively or negatively) by activities within each programmatic category (Table 5). The Level 1 Team, which includes two NOAA Fisheries representatives, concluded that the effects analysis describes most effects that could be anticipated from the programmatic actions and that these effects would not differ between watersheds across the Oregon Coast and Willamette provinces.

To address this, the Level 1 Team selected watersheds from the three major physiographic provinces (Coast Range, Willamette Valley, and Western Cascades) within Northwest Oregon and a small portion of the Deschutes Province (MCR steelhead within the Mt. Hood NF and Columbia River Gorge National Scenic Area), where activities are proposed, for further analysis. The Level 1 Team assumed that a 20% sample of watersheds in each physiographic province would represent the range of baseline conditions and proposed activities across each province.

Table 5. Indicators from Table 1 of NOAA Fisheries (1996a) that could be affected (positively or negatively) by activities within each programmatic category (adapted from Table 7 of the BA).

Programmatic Category	Matrix Indicators																			
	Water Quality			Habitat Access	Habitat Elements							Channel Conditions			Flow/ Hydrology		Watershed Condition			Fish
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Road Maintenance & Storm Proofing	X	X	X	X	X	X	X	X	X				X		X	X		X		
Road Decom/Obliteration	X	X	X	X	X	X	X			X		X	X	X	X	X	X	X	X	X
Aquatic & Riparian Habitat Projects	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X
Rec Site/Trail/Admin Maint Use	X	X	X		X	X				X			X					X		
Fish/WL/Bot/Cult R																				X
Pump Chance/ Helipond Maint	X	X	X	X	X	X	X	X	X				X		X			X		
Rock Quarry Operations		X	X		X													X		
Non-Commercial Veg Treatments	X	X	X		X	X												X		
Misc. Special Use Permits/Leases	X	X	X		X	X							X					X		X
Telephone/Powerline Renewal Special Use/ROW Grants	X	X	X		X	X	X	X	X				X					X		

Key: 1=Temperature; **2**=Sediment/Turbidity; **3**=Chemical Contamination/Nutrients; **4**=Physical Barriers; **5**=Substrate/Sediment; **6**=Large Woody Debris; **7**=Pool Area %; **8**=Pool Character/Pool Quality; **9**=Pool Frequency; **10**=Off-Channel Habitat; **11**=Refugia; **12**=Width/Depth Ratios; **13**=Streambank Condition; **14**=Floodplain Connectivity; **15**=Changes in Peak/Base Flows; **16**=Increase in Drainage Network; **17**=Road Density and Location; **18**=Riparian Reserves; **19**=Disturbance History; **20**=Biological Effects to Fish.

2.1.3.1.1 General Effects

Because of their proximity and connections to streams, ecological conditions and processes in riparian areas strongly influence aquatic habitats. Riparian areas function to provide shade, cover, and channel structural elements; supply and process nutrients; support food webs; supply substrate materials; stabilize streambanks; filter upland sediments; and provide linkages to side channels, floodplains, and groundwater (Sullivan *et al*. 1987, Gregory *et al*. 1991, FEMAT 1993, Spence *et al*. 1996).

Most riparian area functions affecting streams and anadromous fish (including bank stability, shade, litterfall, large wood recruitment) occur within a distance equal to the height of a site-potential tree from the edge of the streambank (FEMAT 1993, p. V-27; Spence *et al*. 1996, p. 216-220) for streams without a floodplain, and decline rapidly beyond that distance. Where there is a floodplain, riparian area functions may extend for a distance equal to the height of a site-potential tree from the edge of the floodplain, since during a flood the entire floodplain can function as the stream channel (Rhodes *et al*. 1994).

Fine sediment introduced into a waterway can cause turbidity. An increase in turbidity can affect fish and filter-feeding macro-invertebrates downstream of the work site. At moderate levels, turbidity has the potential to adversely affect primary and secondary productivity; at higher levels, turbidity may interfere with feeding and may injure and even kill both juvenile and adult fish (Spence *et al.* 1996, Berg and Northcote 1985). Increases in sediment supply beyond the transport capability of the stream can cause stream channel instability, aggradation (sometimes to the extent that perennial streams become intermittent; Cederholm and Reid 1987), widening, loss of pools, and a reduction in gravel quality (Sullivan *et al*. 1987, Furniss 1991, Swanston 1991). For salmon, these changes can mean reduced spawning and rearing success when spawning areas are covered, eggs and fry suffocate or are trapped in redds, food abundance is reduced, and over-wintering habitat is reduced (Cederholm and Reid 1987, Hicks *et al*. 1991).

Buffer widths needed for filtration of sediment vary widely depending on site conditions. Transport of sediment by non-channelized flows increases with slope, and decreases with greater density of obstructions (vegetation, woody debris, rocks, etc.) within a buffer strip. (Belt *et al*. 1992, Spence *et al*. 1996 p. 219). Buffer widths needed for sediment filtration may vary from 30-90 m (98-295 feet) or more depending on slope, parent rock type, and other factors (Spence *et al*. 1996 p. 219, FEMAT 1993 p. V-38). However, streamside buffers are not effective in removing sediment carried in channelized flows (including intermittent streams) that originate outside of the buffer and continue through it (Belt *et al*. 1992).

Large woody material (LWM) is an important component of freshwater salmonid habitat, particularly coho salmon. LWM regulates sediment and flow routing, influences stream channel complexity and stability, and provides hydraulic refugia and cover within stream systems (Bisson *et al*. 1987, Gregory *et al*. 1987, Hicks *et al*. 1991, Sedell and Beschta 1991, Bilby and Bisson 1998). LWM also plays a key role in retaining salmon carcasses (Cederholm and Peterson 1985), a major source of nitrogen and carbon in stream ecosystems (Bilby *et al*. 1996). Large wood in streams has been reduced through a variety of human activities that include past

timber harvest practices and associated activities, as well as the mandated cleanup activities that removed wood from streams throughout the region from the 1950s through the 1970s (FEMAT 1993, Botkin *et al*. 1995, Bilby and Bisson 1998). The removal of trees within a distance equal to one site-potential tree height of streams (approximately 170 to 240 feet for mature conifer trees west of the Cascades, FEMAT 1993) have the potential to change the distribution, size, and abundance of large wood available for recruitment from streamside stands (Hicks *et al*. 1991, Ralph *et al*. 1994, Murphy 1995, Spence *et al*. 1996).

Headwater streams play an important role in watershed function. LWM in headwater streams increases sediment retention by forming depositional areas and dissipating energy; retains non-woody organic matter, allowing it to be biologically processed prior to downstream export as dissolved and particulate nutrients; and delays surface water passage, allowing it to be cooled by mixing with ground water (Sullivan *et al*. 1987, Murphy 1995, Spence *et al*. 1996, Bisson and Bilby 1998). Additional wood can be recruited to fish-bearing streams from upslope and upstream areas through landslides and debris flows (McGarry 1994, Reeves *et al*. 1995). In some areas, wood transported in this manner may constitute up to 50% of the wood recruited to downstream reaches (McGarry 1994). McDade *et al*. (1990) could not account for 48% of the existing LWM pieces in a study of recruitment from streamside areas.

Stream shade can be affected by vegetation removal within a distance equal to approximately three-quarters of a site potential tree height (FEMAT 1993, Spence *et al*. 1996). For small streams in western Oregon, the riparian buffer width needed to provide 75-90% of angular canopy density varies widely, from 30-145 feet (Beschta *et al*. 1987).

Water temperature within a stream is a function of both external factors, such as solar radiation, air temperature, precipitation and flow, and internal factors such as width-to-depth ratios, groundwater inputs, and hyporheic exchange (Poole and Berman 2001). Forest management can affect both external factors (*e.g*., solar radiation to the stream can be increased by canopy reduction) and internal factors (*e.g*., connectivity of streams with floodplains) (Bisson *et al*. 1987, Bilby and Bisson 1998). A review of the effects of riparian canopy removal on stream temperatures at the reach scale concluded that increases in average summer maximum temperatures of about 5.4 to 14.4° F are common (Beschta *et al*. 1987). Reduction in large wood recruitment, increased landslide rates and sediment yield, more efficient sediment routing, reduced bank and channel stability from logging, road construction, and road use can combine to make streams wider and shallower, with fewer and shallower pools (Sullivan *et al*. 1987, Swanston 1991, Furniss 1991, Gregory *et al*. 1987, Hicks *et al*. 1991). Such streams are more susceptible to warming.

In microclimate studies by Brosofske *et al*. (1997), stream water temperature was unaffected by buffer sizes of 39-236 feet in width on streams that were 7-13 feet wide with moderate to steep slopes, in a variety of valley formations and with various aspects. One stream without a buffer was warmer than the other streams. Soil temperature (which can be affected by forest canopy openings), even outside the riparian buffers, had a strong influence on stream water temperature.

Microclimate functions are affected by activities in an area greater in width than what is commonly defined as the riparian area. Natural riparian microclimate extended at least 45 meters (148 feet) from streams in a Douglas-fir and western hemlock forest, although some variables extended up to 300 meters (984 feet) from streams (Brosofske *et al*. 1997). Edge effects from clearcut harvest of Douglas-fir extended 30 to >240 meters (98 to >787 feet) into the adjacent forest (Chen *et al*. 1995). Altered light regimes, humidity, wind, temperature, soil moisture and tree seed availability within buffer strips adjacent to harvested areas may foster a shift away from coniferous trees toward herbaceous or shrub vegetation that would not, over the long term, provide the volumes of wood needed to enhance fish habitat (Carlson *et al*. 1990, Hibbs and Giordano 1992). Shrubs may be less efficient at shading streams, leading to higher stream temperatures (Carlson *et al*. 1990).

Several of the proposed programmatic categories include PDCs that require in-water work occur during periods of the year recommended by the Oregon Department of Fish and Wildlife. For each watershed the recommended work periods reflect that watershed's Pacific salmon outmigration and run timing. NOAA Fisheries agrees that because Pacific salmon have a migratory life-cycle these ODFW recommended periods coincide with times of low relative abundance and thereby minimize species exposure.

2.1.3.1.2 Road Maintenance and Storm Proofing

Riparian vegetation can be disturbed when culverts are upgraded or when roads are brushed (i.e. when brush alongside roads is mechanically or manually removed). Brushing along roads that parallel the stream channel for several miles could increase water temperatures due to reduction of shade. Generally, however, brushing is limited to within four feet of the road ditchline and outside shoulder. Maintenance of roads that do not closely parallel streams is likely to have little or no effect on water temperature. When culverts are upgraded or additional ones installed, riparian shrubs and trees may be cut and excavated to access each site. This type of activity is likely to have no or a localized effect on water temperature because of the small amount of vegetation being removed. Brushing does not prune larger, overstory trees that provide most of the shade for streams. Falling and removal of hazard trees along roads may reduce the amount of large wood in riparian areas, thus reducing the potential for large wood recruitment to streams.

Road maintenance generally helps to limit sediment input and turbidity from road systems over time. However, the maintenance activities themselves can contribute some sediment to streams. Fine sediment can be generated from surface and drainage maintenance (*e.g.*, grading and ditch cleaning), culvert replacement and repair, culvert cleaning, stabilization of storm-damaged roads, road repairs and stabilization, and removal of material from small landslides. The amount of fine sediment which could potentially enter a stream as a result of road maintenance activities will depend on the road surface type, weather conditions at the time the road maintenance is being performed, proximity of the road to the stream, whether road ditches are connected to streams, and the density and type of vegetation and other materials between the road and the stream. The proposed PDCs (*e.g.*, seasonal restrictions of soil-disturbing maintenance activities) will limit

the amount of fine sediment entering stream channels. Where sediment does enter the stream, effects on fish could include reduced respiration efficiency due to gill irritation and reduced feeding efficiency due to poor visibility. These effects should be short term and should not seriously injure or kill listed fish.

Some sediment may enter stream channels because of heavy equipment use and disturbance of soils, particularly during culvert replacement actions. Short-term effects such as localized increases in fine sediment in certain stream reaches may occur. However, effects are unlikely to be prolonged, result in substantial changes in substrate composition, or decrease growth or survival of freshwater life stages of listed fish species. If projects are successfully implemented, substrate quality should actually improve over time, because chronic sediment sources would be corrected.

Contamination to the stream channel from the proposed activities could occur from equipment leaks (*e.g.*, diesel fuel, oil, hydraulic fluids, and antifreezes) or spills from refueling during project implementation. However, following the proposed PDC of refueling at least 150 feet from a stream and having spill containment equipment on hand should reduce the risk of these hazards. Contamination may also occur from wet concrete or wastewater when bridges or culverts are repaired. Spilled wet concrete and wastewater runoff from concrete curing can cause rapid pH swings, which has the potential to kill or stress fish. However, most routine maintenance does not involve concrete and spills are infrequent. Overall risk to water quality should be negligible. Asphalt used during resurfacing can leach out petroleum hydrocarbons, which can be toxic and influence pH. Because routine maintenance generally patches small road segments, during dry conditions, hydrocarbon leaching should have a minimal effect on water quality. Extensive patching during wet periods may pose a greater risk and could be outside the typical range of effects in this programmatic.

Some dust abatement materials can also pose a risk to water quality. However, water is the only dust abatement material proposed under this programmatic consultation. Adherence to the relevant agency BMPs and PDCs should minimize or avoid adverse effects (*e.g.*, sediment transport) from this dust abatement practice.

Streambanks may be disturbed when culverts are upgraded or replaced. Streambank vegetation may need to be removed from the work site causing streambanks to be temporarily exposed to streamflow until new vegetation is reestablished. Maintenance activities may result in a loss of riparian vegetation if the road is close to the channel, which could cause some localized streambank instability. NOAA Fisheries expects generation of sediment and reduction of stream shade from these activities to be minor.

Location of roads in relation to streams, specifically hillslope position, strongly influences how much surface and subsurface water flow a road intercepts. Mid-slope and lower slope roads have the greatest potential of intercepting and re-routing flows. Increased runoff from improperly maintained roads can increase sediment transport efficiency and peak stream flows which may destabilize stream channels and reduce habitat quality. With the installation of more

or larger cross drain culverts, road maintenance can substantially improve hillslope drainage. How much drainage is improved depends on the number and locations of cross drains installed, the road's gradient and shape, the amount of water draining from the slope, and the type of precipitation (*e.g.*, rain, snow, etc.).

Activities that occur in or near streams can disturb or harm adult and juvenile fish. Culvert upgrades, removals, and valley bottom road removals may take several hours or days to complete. NOAA Fisheries expects that listed fish would move into habitats above or below work sites to avoid equipment in or near stream channels, and then quickly reoccupy the vacated habitats as flows are re-established within the completed channels.

2.1.3.1.3 Road Decommissioning and Obliteration

Riparian vegetation can be disturbed when culverts are removed, over-steepened fills are pulled back, and when roads are inactivated or permanently removed. When culverts are removed, riparian shrubs and trees may be cut and excavated to access each site and restore proper channel dimensions. This type of activity is likely to have no or localized effects on stream shade and water temperature because of the small amount of vegetation being removed. Culvert removal could only affect water temperature if numerous culverts were removed in the same drainage, or when completed in conjunction with other vegetation-altering activities. NOAA Fisheries expects that removal or closure of valley bottom roads would have a positive effect on stream temperature in the long term. Trees and other riparian vegetation would re-colonize a decommissioned or obliterated roadbed and, in time, help shade the stream.

If properly designed and maintained, road decommissioning and obliteration can decrease sediment loading to streams and, over time, improve habitat conditions. However, before such improvements can be realized, short-term sediment and turbidity increases may occur from culvert removal, fill removal, and re-contouring of roads, depending on the size and nature of the action. Sedimentation can also occur for several years after the project is completed until a stream channel or hillslope adjusts to its original form and vegetation has been established. Sediment from design failures could also occur, especially in steep, unstable terrain or in climates that can produce rapid surface and subsurface flows (*e.g.*, from rain-on-snow events). Depending on how much sediment reaches a stream, short-term effects to listed fish could include increased gill irritation resulting in reduced respiration efficiency and reduced feeding efficacy due to poor visibility. However, effects are unlikely to be prolonged, result in substantial changes in substrate composition, or decrease growth or survival of freshwater life stages of listed fish species. The proposed PDCs (*e.g.*, timing of work, requirements for disposal of fill material, use of sediment trapping material) will help to limit sediment effects. If road decommissioning and obliteration projects are successfully implemented, substrate quality should actually improve over time, because chronic sediment sources would be corrected.

Activities that occur in or near streams can disturb or harm adult and juvenile fish. Culvert upgrades, removals, and valley bottom road removals may take several hours or days to complete. NOAA Fisheries expects that listed fish would move into habitats above or below

work sites to avoid equipment in or near stream channels, and then quickly reoccupy the vacated habitats as flows are reestablished within the completed channels.

2.1.3.1.4 Aquatic and Riparian Habitat Projects

Riparian vegetation can be disturbed when channels adjust alignment, access roads are constructed, trees are thinned to improve riparian stand conditions, trees are pulled over or cut to provide instream structures, or trees are removed when side channels are excavated. As stated previously reductions in riparian vegetation can reduce channel shading and increase water temperatures. The proposed PDCs (*e.g.*, minimize stream entry points, do not fall conifers in riparian areas unless stand is fully stocked) should prevent adverse effects to water temperature.

Instream restoration structures (*e.g.*, placement of large wood and/or boulders in a stream) can reduce width/depth ratios and increase pool frequency which can result in water temperature reductions.

Construction of restoration access roads, channel excavation, some types of structure placement, culvert replacement, and hauling materials over native surface roads could increase sediment delivery to stream channels. Stream sediment loads may also increase for several years after the project is completed until a stream channel adjusts to its original form and vegetation has been established. NOAA Fisheries expects the proposed PDCs will limit sediment generation and design failures.

Chemical contamination of the stream channel could occur from equipment leaks (diesel fuel, oil, hydraulic fluids, and antifreezes) or refueling spills during project implementation. However, the proposed PDCs should significantly reduce these hazards.

Existing culverts may be removed and replaced with new structures (*e.g.*, clear-span bridges), or removed without replacement in order to restore passage at locations that were previously barriers to adult and juvenile fish movements.

Placement of large wood can create more complex fish habitat, benefitting juvenile Pacific salmon rearing. The stability or longevity of this wood within streams is strongly linked to its size, orientation to flow within the stream, channel dimensions, watershed are upstream from the structure, and the percentage of the log that is in the active stream channel. The PDCs require the use of whole trees or tree pieces that are of sufficient size to mimic natural accumulations in a given stream.

The goal of placing salmon carcasses in streams is to benefit a wide geographic area, and to restore stream nutrient levels to historical levels. Nutrients that would be added from salmon carcasses include carbon, nitrogen, and phosphorus. NOAA Fisheries expects that distribution of salmon carcasses in selected watersheds will increase stream nutrient levels in these areas over time.

Some projects that artificially stabilize a streambank may be necessary. However, in most situations, leaving the streambank alone or riparian planting, rootwad revetments, or placement of logs and boulders diagonal to stream flow are better alternatives. Treatments that harden stream banks and leave them in an unnatural condition can cause channel erosion downstream and alter natural channel processes. Instream structures can cause stream bank erosion by creating velocity vortices at high flows. The proposed PDCs should ensure these effects are minimized. Potential benefits of correctly installed instream structures include increased habitat complexity, reduced width/depth ratio, and increased pool habitat.

Potential benefits resulting from culvert removal/replacement or cleaning of fish ladders include better access for fish and other aquatic organisms and better routing of flood flows and associated bedload. Sometimes, the correction of culvert barriers can allow introduced species greater access to tributary habitats. This can increase competition, hybridization, and the displacement of native salmonids by nonnative or hatchery fish. Projects with these potential effects should be analyzed further and may be outside the proposed programmatic activities considered in this consultation.

2.1.3.1.5 Recreation Site, Trail, and Administrative Structure Maintenance and Associated Public Use

Clearing brush and felling hazard trees in riparian areas could increase solar radiation to streams. However, the proposed PDCs require that brushing not occur within 10 feet of intermittent and 20 feet of perennial streams. This is expected to protect overhanging vegetation that is currently providing shade close to streams. However, taller alders or hazard trees providing shade outside this buffer could be cut as needed. Past experience with trail and recreation site maintenance shows that only a few hazard trees are cut per year at any one site or trail. Therefore, effects to water temperature should be minimal since removal of hazard trees would be localized and not enough trees would be removed to significantly reduce stream shade.

Aquatic habitats could potentially be affected from trail maintenance through sediment delivery associated with removal of material from small landslides and trail tread repair. Trail tread maintenance may cause localized, short-term sediment yield increases when rocks or roots are removed. Removal of landslide material may also contribute sediment. The potential for sediment input to streams is dependent on the amount of ground disturbance at the site level, distance from the stream, slope steepness, and distance to nearest occupied habitat. NOAA Fisheries expects the proposed PDCs to minimize potential sediment effects.

Recreation site maintenance is expected to produce only minimal amounts of sediment. Grading and resurfacing of graveled roads in campgrounds may produce sediment. However, it is unlikely that sediment would affect aquatic habitats since riparian buffers would filter most sediment before reaching a stream, grading is generally conducted during dry conditions, and graded material would be kept out of drainage ditches where it can be transported to streams.

Spills may occur during routine trail and recreation site maintenance. Spills may include fuel, oil, cleaning materials, or human waste associated with equipment and the pumping of toilets. NOAA Fisheries expects the proposed PDCs to minimize spills and their effects.

Trail and recreation site maintenance can affect instream wood by creating smaller, more mobile pieces when blowdown trees and hazard trees are cut to allow passage along streamside trails. NOAA Fisheries expects the proposed PDCs to minimize these effects to streams.

In some coastal areas, this programmatic category may include the maintenance and operation of a few tide gates that control flow into off-channel habitats along lower mainstem rivers or tributaries, or in estuaries. Properly functioning tide gates can increase access to off-channel rearing areas for anadromous salmonids. Improperly functioning tide gates can impair fish passage, and can prevent the flooding of off-channel areas that can benefit rearing juvenile fish.

Brushing along trails and in recreation sites along streams has the potential to cut riparian vegetation needed to maintain streambank stability and stream shade, and to provide organic material to streams. PDCs would provide buffers along streams, and brushing does not prune larger overstory trees that provide the most shade.

2.1.3.1.6 Fisheries, Hydrology, Wildlife, Botany, and Cultural Programs

Activities associated with some types of surveys and monitoring can disturb or stress adult/juvenile fish or crush eggs/fry buried in the gravel. The proposed PDCs (redd identification, proper training, and coordination) should reduce these risks. Disturbing adult fish while spawning can reduce reproductive success through either prevention of redd (nest) establishment, displacement of adults to less suitable habitats, creation of poorly constructed redds, or expenditures of excess energy resulting in premature death of spawning adults (Dufour 1995).

2.1.3.1.7 Pump Chance/Helipond Maintenance and Use

Streamside trees and shrubs may be cut to provide better access to water drafting sites and for hazard tree removal at those sites. Most of this work would include brushing previously cleared areas with few, if any, larger trees removed. Riparian vegetation cleared would include willows, alders, big leaf and vine maple; and, around ponds, cattails. Clearing of any riparian vegetation may prevent establishment of a full complement of riparian cover within riparian zones. Removal of riparian vegetation would be minimal along roadside pullouts used for water drafting, but may be more frequent along valley bottom spur roads. Effects to water temperature would be negligible because of the removal of vegetation that shades streams would be localized.

The greatest potential for increasing turbidity from the activities is from the deepening of pump chance sites. Sites that require extensive excavation with abundant fine sediment could create

turbidity plumes hundreds of feet downstream, while in other situations turbidity plumes may only occur within a few feet of the site. The proposed PDC's require that sediment control be used if conditions warrant their use. Activity will also be limited to the low flow period. Therefore, turbidity increases are likely to be short term, lasting no more than a few minutes to hours.

The use of heavy equipment in streams or along stream banks and refueling of pumps can present a hazard if fuel or oil leaks into streams. However, the proposed PDC of refueling at least 150 feet from a stream and having spill equipment on hand should reduce these hazards.

In smaller streams that lack deeper pools, small dams may be built to pond water to facilitate pumping directly into a truck or a temporary basin along a road. Use of temporary dams is likely to be infrequent, however, because they are time consuming to construct and do not always provide enough flow to meet demands. Dams can be in place for several hours or days depending on the water needed. The construction of dams that block fish passage is not covered under this consultation.

Recruitment of woody material would be reduced when hazard trees are cut along spur roads and when in-channel debris is moved to excavate a pool. Overall effects to wood recruitment should be minimal because few hazard trees would be cut at each site, sites comprise a small portion of the overall riparian area, and cut trees will be left on site.

Construction of pools in-channel can mobilize sediment. Pool excavation generally occurs in small perennial streams, but can sometimes occur in larger fish-bearing stream. Generally, sites are not excavated more than once or twice every 5 years, but some sites in streams with heavy bedloads could be excavated yearly. The proposed PDCs (e.g., timing of in-water work, pump screen criteria, maintaining at least half of existing stream flow downstream from the site) should minimize the effects of these actions on listed fish.

2.1.3.1.8 Rock Quarry Operations

Rock quarry activities can generate sediment when pits are excavated and when the material is crushed, piled, and hauled. Quarries that are in riparian areas can transport sediment through over-steepened fills, compacted surfaces and excavated slopes. Quarries outside riparian areas may transport sediment via roads, but only if the quarry road ditchline connects to a stream or the haul road is close to and parallel with a stream. NOAA Fisheries expects that PDCs which require excavation and hauling during the dry season for quarries located in riparian areas will minimize sediment transport. Turbidity from rock quarries during spring snowmelt could last a few hours to days depending on use. Turbidity resulting from storm events would likely not be discernible from other sediment sources.

Chemical contamination could occur from equipment leaks or refueling. Since most use is expected to occur in the dry season to meet the proposed PDCs, if spills did occur, contamination would be confined to the soil surrounding the spill.

Rock quarries generally have compacted soils and are more prone to overland flow during intense rain or rapid snow melt. Peak flows could be increased by accelerated runoff from quarries if the overland flow reaches ditchlines, occurs near streams without vegetated buffers, or contributes to increased groundwater recharge.

Riparian vegetation can be affected by sidecasting crushed rock, removal of hazard trees, rock excavation, and vehicle use within the quarry. According to the BA, most rock quarries are not located near streams. However, a few quarries are likely to have small intermittent streams near or within the site. Continued use of these quarries prevents the establishment or recovery of riparian vegetation along these channels. Quarries along larger streams generally have a road or tree buffer between the quarry and the stream.

2.1.3.1.9 Non-Commercial Vegetation Treatments

Precommercial Thinning

Precommercial thinning (PCT) in riparian areas has the potential to increase solar radiation to streams, increasing water temperature (Beschta *et al*. 1987). However, the proposed PDCs require that an untreated or modified treatment area within riparian areas be maintained (10 feet on each side of ephemeral streams) and an untreated buffer of 20 feet on each side of perennial streams to prevent any potential adverse affects to stream channels or water quality conditions. PCT involves cutting of small trees (2 to 4 inches diameter-at-breast-height) which are left on site. Because trees cut during PCT are less than 10 feet tall, it is unlikely that stream shade would be affected. Larger trees would not be cut, because they are not the target of PCT. PCT would also have negligible effects on sediment because very little ground disturbance takes place when these small trees are cut.

PCT in riparian areas would have minimal affect on the amount of woody material in streams. The proposed PDC are designed to provide an untreated area that will maintain enough recruitment of woody material to sustain stream channel and habitat features.

Noxious Weeds

Noxious weeds would be treated using a combination of mechanical control such as hand-pulling and clipping, and biological control through parasites and pathogens. The use of herbicides is not covered under this programmatic Opinion.

Mechanical treatments could result in localized soil disturbance as plants are pulled. Increased sediment to streams along road cuts and fills and within riparian areas is possible, but the increase would likely be undetectable, since only a limited amount of vegetation would be removed in a treated area. Not all sediment from pulling weeds along roads would reach a stream because relief culverts intercept ditch flow and drain it onto the forest floor away from streams, and because hand pulling is very labor intensive and costly, so only a few acres per year within any watershed could be treated using this technique.

Prescribed Fire

Since the proposed PDCs do not allow intentional prescribed burning within riparian areas, any effects to aquatic resources would likely result from hand-construction of fire lines, lost upland vegetation or exposure of hydrophobic soils. Hand-constructed fire lines can create erosion from the excavation. However, hand-constructed fire lines are not constructed for every burn. They are generally needed only when weather or burn conditions dictate the protection of a particular resource, like riparian reserves. When needed, hand- constructed fire lines are generally not constructed in a riparian area, but parallel to them. This technique protects stream bank vegetation and leaves a vegetative buffer in place, which filters sediment. If hand-constructed fire lines are used on steeper ground, lines would be water barred to reduce erosion.

Exposed soil can be present following a prescribed burn, and would be prone to erosion until the regrowth of grass and other vegetation. Conducting burns during wetter conditions will reduce the risk of producing hydrophobic soils because the intensity of the burn should be low. Given the small number of acres that could be burned each year and the use of riparian buffers, it is unlikely that enough sediment or nutrients would be generated to adversely affect aquatic resources.

In a transient snow zone, prescribed fires that reduce canopy closure and increase openings will cause more rapid accumulation of snow and more rapid melting of snow. This is primarily due to reduced interception of precipitation by the tree canopy. This can increase sediment generation and peak stream flows that can damage fish habitat. NOAA Fisheries understands prescribed burning in the context of the Non-Commercial Vegetation Treatment category is intended to reduce understory shrubs in small parcels of land outside of riparian areas, and will not appreciably reduce canopy closure. As burning will not substantially increase forest openings, peak flow alteration is likely to be insignificant or discountable. The exclusion of riparian areas from prescribed burning areas is likely to minimize sediment delivery to stream channels.

Although the proposed PDCs are designed to protect riparian areas, fire can escape control lines and burn riparian vegetation. A fire burned under the right conditions with good control measures will likely include only minor fire encroachment into riparian areas. In contrast, fires that escape control lines may burn through riparian areas consuming some ground fuels and riparian trees. However, due to the small scale of most escaped fires, it is unlikely that fire in riparian areas would adversely affect listed fishes or their habitat.

2.1.3.1.10 Miscellaneous Special Use Permits and Leases

This category includes issuance of permits to outfitters and guides in the Willamette River basin for the purpose of recreating on surface waters. Rafting and kayaking can disturb adult and juvenile fish and kill or injure eggs and pre-emergent fry. Disturbance of older-age class juveniles and adults, including adult chinook salmon and steelhead holding over the summer, can occur when rafting or kayaking occurs over holding pools. Fish holding in these pools are likely to respond behaviorally to these disturbances (*e.g.*, seek refuge near pool bottom or within

inflowing bubble curtain). Rafting and kayaking on some of the more heavily used rivers (*e.g.*, McKenzie and Clackamas) generally occurs prior to spawning by adult chinook salmon. During chinook salmon spawning time, those portions of rivers where chinook spawn are generally too low to float. In addition spawning gravels occur in scattered pockets and along stream margins rather than being concentrated in large spawning riffles, making disturbance of spawning adult fish less likely. Listed steelhead are not present in the McKenzie River system, and LCR steelhead in the Clackamas River system are not likely to spawn in river reaches used by rafters and kayakers, favoring instead tributary streams and river reaches upstream. Special use permits for rafters and kayakers designate launch sites and take-out locations to avoid disturbance of adult fish. As the action agencies did not indicate the issuance of surface water recreation permits that would be likely to adversely affect listed fish outside of the Willamette River basin, the effects of this activity were not evaluated elsewhere in the action area.

Special use permits are also issued for renting government-owned cabins, lookouts, and barns; stockpile sites for sand and gravel; camping and picnicking sites; disposal sites and transfer stations for garbage, trash, and other non-hazardous solid waste; group events; facilities for radio, cell phone, and microwave communication sites; and water flow gauging stations. Other than permits for recreating on surface waters, only activities that are not anticipated to adversely affect habitat indicators (*e.g.*, will not contribute sediment or reduce large woody material in stream channels), including interrelated and interdependent effects, are covered by this Opinion. NOAA Fisheries agrees that these activities, exclusive of surface water recreation, completed as described (including adherence to PDCs) will have insignificant and discountable effects on listed Pacific salmon or their habitat.

2.1.3.1.11 Telephone Line and Power Line Renewal Special Use Permits/Rights-of-way Grants

Power and telephone lines require vegetation to be cleared from the center of the line to a set distance (usually 10 to 50 feet either side of the line). Telephone lines and smaller spur powerlines along roads may require vegetation removal only along one side of the line. Vegetation is cleared on a set rotation that is usually once every 5 to 10 years. Vegetation can be controlled by removing limbs, hazard trees, and brush. The clearing of brush and trees in riparian areas may increase solar radiation to streams. The proposed PDCs require that brush removal not occur within 10 feet of intermittent or ephemeral streams or within 20 feet of perennial streams. This PDC will protect overhanging vegetation that is currently providing shade close to streams. However, trees providing shade within and outside this buffer would be limbed or topped as needed. NOAA Fisheries expects that, because of the limited number of stream crossings by these facilities and the infrequent maintenance (commonly once every 5-10 years), effects on stream shade and water temperature would be minimal.

The repair and maintenance of underground cables may require excavation and soil disturbance. Most maintenance would be completed in the summer and appropriate BMPs would be used. Therefore, excavation of a line in a road's fill slope would likely cause only localized sediment delivery to streams that would not substantially increase turbidity. Excavation in a ditchline that

crosses several streams may increase sedimentation and turbidity. Excavated trenches are usually small (approximately 6-8 inches wide and 10-30 feet deep), resulting in localized bank erosion. Excavation is not required over large streams because cables are attached to bridges, buried in the roadbed, or bored under the stream. Rainfall may mobilize sediment from disturbed soils if vegetation has not been restored at the site. Turbidity increases could last a few hours to days depending on the soil disturbance at the site. NOAA Fisheries expects that use of PDCs will minimize impacts on listed fish or their habitat.

The use of heavy equipment and chainsaws near streams can present a hazard from leaks and spills of fuel or lubricant. However, the proposed PDC of refueling at least 150 feet from a stream and having spill equipment on hand should reduce these hazards.

2.1.3.1.12 Aggregated Effects of Proposed Action

The Level 1 team concluded that some effects may not have been considered due to unique watershed conditions or from cumulative (aggregated) effects of multiple activities within each watershed. Twenty-seven 5th field watersheds were selected between the three provinces using the following criteria: condition category (properly functioning, at risk, or not properly functioning) (NOAA Fisheries 1996a), the proportion of Federal lands in each watershed, high numbers of programmatic activities, and adequate baseline information. Of these 27 selected watersheds, two are rated as properly functioning, 14 are functioning at risk, and 11 are not properly functioning. The Level 1 Team considers the 27 watersheds to be a biologically conservative representation of those not described in detail because they represent a range of baseline conditions and have high levels of proposed activity.

Fishery biologists and Level 1 Team members from each action agency administrative unit reviewed the anticipated effects of the proposed activities within each programmatic category in relation to the environmental baseline, unique watershed conditions, and their spatial and temporal distribution. Based on best professional judgment, the reviewers found that the proposed actions individually and cumulatively likely would cause effects that were too small in scale, duration, and intensity to cause a "shift" (*e.g.*, from properly functioning to functioning at risk) in any habitat indicators (NOAA Fisheries 1996a) at the fifth field scale.

NOAA Fisheries also considered the following in analyzing the potential for aggregated watershed effects:

1. Anticipated activity levels by watershed (described in Appendix A).
2. The nature, magnitude, intensity, duration, frequency, timing, distribution, and probability of disturbance to aquatic, riparian and watershed habitat functions and conditions from the proposed activities.
3. Specific PDCs, developed during a lengthy cooperative process with NOAA Fisheries, that avoid or minimize adverse effects on aquatic, riparian and watershed functions and conditions important to the listed species.

Based on the above information, NOAA Fisheries determined that any aggregated watershed effects from the proposed activities are likely to be predictable, minor, and short-lived, and are unlikely to prevent, or appreciably delay, attainment of aquatic, riparian and watershed functions and conditions that meet the biological requirements of the listed species for survival and recovery.

2.1.3.2 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." This is step 4 in NOAA Fisheries analysis process.

NOAA Fisheries is not aware of any specific future non-federal activities within the action area that would cause greater impacts to listed species than presently occurs. The action area includes significant tracts of private and state lands. Land use on these non-federal lands include timber production, agriculture, and urban development. Chemical fertilizers or pesticides are used on many of these lands, but no specific information is available regarding their use. Furthermore, NOAA Fisheries does not consider the rules governing timber harvests, agricultural practices, and urban development on non-federal lands within Oregon to be sufficiently protective of watershed, riparian, and stream habitat functions to support the survival and recovery of listed species. Therefore, these habitat functions likely are at risk due to future activities on non-Federal forest lands within the basin.

Non-federal activities within the action area are expected to increase with a projected 34% increase in human population over the next 25 years in Oregon (DAS 1999). Thus, NOAA Fisheries assumes that future private and state actions will continue to occur at similar levels within the action area and will increase gradually over time as population density increases.

2.1.3.3 Concurrence with NLAA Activities

Based on information provided by the FS and BLM, NOAA Fisheries concurs with the action agencies' determination that those activities described in Table 2 as NLAA and listed in Appendix A may affect, but are not likely to adversely affect listed Pacific salmon for the following reasons: (1) Each proposed activity has project design features (Table 2) that will ensure that adverse effects, if any, to aquatic and riparian habitats will be negligible; and (2) all relevant aquatic habitat indicators for listed anadromous salmonids will be maintained or improved. Thus, effects to the species are likely to be insignificant and discountable.

2.1.4 Conclusion

The final step in NOAA Fisheries' approach to determine jeopardy is to determine whether the proposed action(s) is likely to appreciably reduce the likelihood of species survival or recovery in the wild. In reaching its conclusion, NOAA Fisheries used the best scientific and commercial

data available, including the BA and supporting documentation, incorporated by reference. NOAA Fisheries considered the status of listed and candidate Pacific salmon, environmental baseline conditions, the direct and indirect effects of the proposed actions individually and in aggregation, and cumulative effects anticipated in the action area.

Based on the above information, NOAA Fisheries determined that the proposed 10 programmatic categories of action could cause predictable, minor, and short-lived adverse effects to listed and candidate species, but are unlikely to prevent, or appreciably delay, attainment of habitat functions and conditions that meet the biological requirements of the listed and candidate species for survival and recovery. The proposed action therefore is unlikely to reduce pre-spawning survival or egg-to-smolt survival to levels that would appreciably reduce the likelihood of survival and recovery of OC and LCSW coho salmon; LCR, UWR, MCR, and OC steelhead; LCR and UWR chinook salmon; or CR chum salmon.

2.1.5 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species or to develop additional information.

The following conservation recommendation is consistent with these obligations, and therefore should be implemented by the FS and BLM.

1. In order to better track the aggregated effects of these programmatic activities, the FS and BLM should develop a system to allow real-time tracking of programmatic activities.

In order for NOAA Fisheries to be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed species or their habitat, NOAA Fisheries requests notification of the implementation of any conservation recommendation.

2.1.6 Reinitiation of Consultation

This Opinion expires on September 30, 2007. To avoid a lapse in coverage, consultation must be reinitiated with sufficient time to complete consultation prior to that date.

It must also be reinitiated if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or, (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

Additionally, if the FS and BLM fail to provide the specified annual monitoring information by the required date (see infra section 2.2.3, Term and Condition #3), NOAA Fisheries will consider that a modification of the action that causes an effect on listed species not previously considered and causes the incidental take statement of the Opinion to expire.

To reinitiate consultation, the FS and BLM must contact the Habitat Conservation Division (Oregon Habitat Branch) of NOAA Fisheries at 525 NE Oregon Street, Suite 500, Portland, Oregon 97232-2778. The FS should reference 2002-01254. The BLM should reference 2002/01880.

2.2 Incidental Take Statement

Section 9 and rules promulgated under section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. "Harass" is defined as actions that create the likelihood of injuring listed species by annoying it to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. "Incidental take" is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in complicance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the effect of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize adverse effects and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of the Take

NOAA Fisheries anticipates that the actions covered by this Opinion are reasonably certain to result in incidental take of LCR, UWR, and MCR steelhead; LC and UW chinook salmon; OC coho salmon; or CR chum salmon. Effects of actions such as these are largely unquantifiable because take is in the form of harm, which includes habitat modification. Quantifying take associated with habitat modification is problematic because of the complexity of cause and effect relationships. Therefore, even though NOAA Fisheries expects some low level of incidental take to occur due to the actions covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take to the species. Based on the information in the BA, NOAA Fisheries anticipates that an unquantifiable amount of incidental take could occur as a result of actions covered by this Opinion. In instances such as these, NOAA Fisheries designates the expected level of take in terms of the extent of take allowed. Allowed take is limited to take resulting from the actions as

proposed (including project design criteria), that occurs within the action area. Take that occurs from actions that exceed the range of effects analyzed in the BA, that do not follow the PDCs, or that extends beyond the action area is not authorized by this Opinion.

2.2.2 Reasonable and Prudent Measures

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to avoid or minimize take of LC, UW, and MC steelhead; LC and UW chinook salmon; OC coho salmon; or CR chum salmon resulting from implementation of this Opinion.

1. Minimize incidental take from programmatic activities by following the proposed PDCs described in the BA.

2. Minimize incidental take associated with the implementation of land management activities addressed in this Opinion by avoiding and minimizing adverse effects to aquatic and riparian habitat.

3. Complete an annual report (monitoring and reporting requirements reiterated in terms and conditions below) each year for 5 years to ensure this programmatic Opinion is meeting its objective of minimizing the likelihood of take from proposed activities and provide the report to the Oregon Branch of NOAA Fisheries.

2.2.3 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the FS and BLM must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. Implementation of the terms and conditions within this Opinion will further reduce the risk of adverse effects to listed fish. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure #1 (PDCs), the FS and BLM shall:

    a. Follow all PDCs for each programmatic category provided in Table 5 of the BA (repeated in this Opinion as Table 2).
    b. Delineate riparian areas in accordance with the description of riparian reserve widths provided on pages C-30 and C-31 of Northwest Forest Plan Standards and Guidelines (FS and BLM 1994).

2. To implement reasonable and prudent measure #2 (implementation of land management activities) the FS and BLM shall:

    a. Confine effects of land management activities to the minimum area necessary to complete the project.

b. Have a fish screen installed, operated and maintained in accordance to NOAA Fisheries' fish screen criteria (NOAA Fisheries 1995, 1996b) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm) on any water intake structure used in waters potentially containing ESA-listed fish.

c. Complete work within the active channel during the ODFW preferred in-water work period, as appropriate for the project area (ODFW 2000). Exceptions must receive NOAA Fisheries' concurrence in writing prior to work being performed.

d. Minimize effects to ESA-listed fish during in-water work-site isolation activities.

   i. Handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during transfer procedures. The transfer of ESA-listed fish must be conducted using a net or other device that holds water during transfer, whenever necessary to prevent added stress of an out-of-water transfer.

   ii. Seined or transferred listed fish must be released as near as possible to capture sites.

   iii. Documentation of all capture and release efforts shall be filed with the associated project records within 30 days and be submitted to NOAA Fisheries with the annual report. Documentation shall include, at a minimum:

      (1) A written description summarizing any seine, transfer, or release effort;

      (2) the name and address of the supervisory fish biologist;

      (3) the methods used to isolate the work area, including duration of isolation;

      (4) the means of fish removal;

      (5) the estimated number of fish removed by species; and

      (6) any incidence of observed stress, abnormal behavior, injury, or mortality.

e. Minimize work that inhibits the passage of any adult or juvenile salmonid species throughout the activity implementation period.

f. Develop pollution and erosion control measures to minimize pollution related to programmatic activities. The measures shall contain the pertinent elements listed below and meet requirements of all applicable laws and regulations:

   i. Erosion and sedimentation control measures shall be applied to access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.

   ii. Hazardous materials shall be identified and consideration given to minimizing their use in proximity to perennial and intermittent stream channels.

   iii. Effective erosion control measures shall be in-place at all times during the contract. Project activities within the project vicinity shall not begin until all necessary temporary erosion controls (*e.g.*, sediment barriers) are in

place. Erosion control structures shall be maintained throughout the life of the contract.

iv. When the erosion control features are at 2/3 capacity they shall be cleaned and maintained. They shall be inspected regularly during project implementation to ensure that they are functioning as intended, and daily during periods of precipitation. Any failure of erosion control measures shall be corrected immediately to maintain sedimentation controls.

g. Design temporary access roads as follows:

i. Use existing roadways or travel paths whenever reasonable.

ii. Avoid riparian areas other than in association with aquatic habitat improvement projects.

iii. Minimize the number of stream crossings.

h. Repair, upgrade, or replace existing tide gates consistent with the following design criteria:

i. Tide gates will be designed to allow passage for adult and juvenile Pacific salmon through 90% of the tidal cycle during migration periods, unless otherwise approved in writing by NOAA Fisheries.

ii. Tide gates must be designed to have a maximum average velocity that does not exceed 2 foot per second.

iii. The bottom lip of a top-hinged flap gate shall be open at least 1.5 feet from the end of the culvert during 90% of the time that the tide gate is open. Side-hinged tide gates shall provide a minimum opening width of at least 1.5 feet during 90% of the time that the tide gate is open.

i. Design and carry out work in tidal wetlands in a manner that minimizes temporary fish entrapment, water quality degradation (*e.g.*, elevated water temperature, reduced dissolved oxygen, increased turbidity), and mortality of benthic prey species.

j. Further <u>exclude</u> the following actions from completion under the subject consultation.

i. The construction of new permanent or semi-permanent roads in or across riparian areas (including 100-year floodplain) or potentially unstable areas (as defined by slope, landform, and soil characteristics).

ii. The construction of new water control structures (*i.e.*, dikes, levees, tide gates, pump stations, and related features).

iii. The application of herbicides and other pesticides. Mechanical removal of undesired vegetation and root nodes is authorized.

3. To implement reasonable and prudent measure #3 (annual monitoring and reporting requirements) the FS and BLM shall:

a. Report the number of LAA projects in certain activity categories by watershed (as shown in Table 6 and Appendix H of the BA). The report will cover the fiscal year period (October 1 - September 30) and is due the following January. The purpose of the reporting is to help estimate the extent and amount of take that may

have occurred and validate assumptions regarding aggregated watershed effects. The Level 1 Team will meet at the end of January to discuss each year's information and assemble the report.

b. In each annual report, include a list of all projects completed under the 10 programmatic categories, and allow NOAA Fisheries to review at its discretion completed *Federal Analysis of Effects and Determination* forms (pages 27 and 28 of the BA and repeated as Appendix B of this Opinion) for select projects. The purpose of this condition is to document those actions covered by the subject consultation and to validate the action agencies' determinations of effect.

c. Send the annual report to NOAA Fisheries at:

NOAA Fisheries
Oregon Habitat Branch
Reference: F/NWR/2002/01254 (FS)
F/NWR/2002/1880 (BLM)
525 NE Oregon Street, Suite 500
Portland, OR 97232

If the FS or BLM fails to provide the specified annual monitoring report for the previous fiscal year by February 28, NOAA Fisheries may consider that a modification of the action that causes an effect on listed species not previously considered and causes the incidental take statement of this Opinion to expire. Exceptions must receive NOAA Fisheries' agreement in writing prior to the due date.

This programmatic incidental take statement shall expire on September 30, 2007. To avoid a lapse in coverage, consultation must be reinitiated with sufficient time to complete consultation prior to that date.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Magnuson-Stevens Fishery Conservation and Management Act

The objective of the essential fish habitat (EFH) consultation is to determine whether the proposed action may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH. EFH means those waters and substrate necessary to fish for spawning, breeding, feeding,

or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and ``spawning, breeding, feeding, or growth to maturity'' covers a species' full life cycle (50CFR600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NOAA Fisheries shall provide conservation recommendations for any Federal or State activity that may adversely affect EFH;
- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the effects of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding any activity that may adversely affect EFH, regardless of its location.

3.2 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. The designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line, and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km)(PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the Exclusive Economic Zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border.

Detailed descriptions and identifications of EFH for the groundfish species are found in the Final Environmental Assessment/Regulatory Impact Review for Amendment 11 to The Pacific Coast Groundfish Management Plan (PFMC 1998a) and the NOAA Fisheries Essential Fish Habitat for West Coast Groundfish Appendix (Casillas *et al*. 1998). Detailed descriptions and identifications of EFH for the coastal pelagic species are found in Amendment 8 to the Coastal Pelagic Species Fishery Management Plan (PFMC 1998b). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of the potential adverse effects to these species' EFH from the proposed action is based on this information.

3.3 Proposed Actions

The proposed actions are detailed above in section 1.2. The action area includes all watersheds within the Willamette, Mt. Hood, and Siskiyou National Forests and Salem and Eugene BLM administered lands, and stream reaches downstream of the administrative unit boundaries that may be affected by Federal land management activities, which are within OC coho; LCR, UWR, or MCR steelhead; LCR or UWR chinook salmon; CR chum salmon, OC steelhead, or LCSW coho salmon ESUs. The majority of this area has been designated as EFH for various life stages of salmon, groundfish and coastal pelagic species (Table 6). Areas not designated as EFH that are within the action area covered by this Opinion are: (1) upstream of Dexter Dam on the Middle Fork Willamette River; and (2) upstream of Cougar Dam on the South Fork McKenzie River.

3.4 Effects of Proposed Action

As described in detail in section 2.1.3, the proposed activities may result in short- and long-term adverse effects to a variety of habitat features. These effects include reduced stream shade, reduced recruitment of large wood to streams, increased sedimentation of riparian and aquatic habitats, possible chemical contamination of water quality, and altered channel morphology.

3.5 Conclusion

NOAA Fisheries believes that the proposed action will adversely affect the EFH for the groundfish, coastal pelagic fisheries, and Pacific salmon species listed in Table 6.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation recommendations (section 2.1.5), the reasonable and prudent measures (section 2.2), and the terms and conditions (section 2.2.3) of this Opinion are applicable to salmon, groundfish and coastal pelagic EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

3.7 Statutory Response Requirement

Please note that the MSA (§ 305(b) and 50 CFR 600.920(j)) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse effects of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.8 Consultation Renewal

The FS and BLM must reinitiate EFH consultation with NOAA Fisheries if either action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

Table 6. Species with designated EFH found in waters of the State of Oregon.

Ground Fish Species	Blue rockfish (*S. mystinus*)	Rougheye rockfish (*S. aleutianus*)	Flathead sole (*Hippoglossoides elassodon*)
Leopard shark (*Triakis semifasciata*)	Bocaccio (*S. paucispinis*)	Sharpchin rockfish (*S. zacentrus*)	Pacific sanddab (*Citharichthys sordidus*)
Soupfin shark (*Galeorhinus zyopterus*)	Brown rockfish (*S. auriculatus*)	Shortbelly rockfish (*S. jordani*)	Petrale sole (*Eopsetta jordani*)
Spiny dogfish (*Squalus acanthias*)	Canary rockfish (*S. pinniger*)	Shortraker rockfish (*S. borealis*)	Rex sole (*Glyptocephalus zachirus*)
Big skate (*Raja binoculata*)	Chilipepper (*S. goodei*)	Silvergray rockfish (*S. brevispinus*)	Rock sole (*Lepidopsetta bilineata*)
California skate (*R. inornata*)	China rockfish (*S. nebulosus*)	Speckled rockfish (*S. ovalis*)	Sand sole (*Psettichthys melanostictus*)
Longnose skate (*R. rhina*)	Copper rockfish (*S. caurinus*)	Splitnose rockfish (*S. diploproa*)	Starry flounder (*Platyichthys stellatus*)
Ratfish (*Hydrolagus colliei*)	Darkblotched rockfish (*S. crameri*)	Stripetail rockfish (*S. saxicola*)	
Pacific rattail (*Coryphaenoides acrolepsis*)	Grass rockfish (*S. rastrelliger*)	Tiger rockfish (*S. nigrocinctus*)	**Coastal Pelagic Species**
Lingcod (*Ophiodon elongatus*)	Greenspotted rockfish (*S. chlorostictus*)	Vermillion rockfish (*S. miniatus*)	Northern anchovy (*Engraulis mordax*)
Cabezon (*Scorpaenichthys marmoratus*)	Greenstriped rockfish (*S. elongatus*)	Widow Rockfish (*S. entomelas*)	Pacific sardine (*Sardinops sagax*)
Kelp greenling (*Hexagrammos decagrammus*)	Longspine thornyhead (*Sebastolobus altivelis*)	Yelloweye rockfish (*S. ruberrimus*)	Pacific mackerel (*Scomber japonicus*)
Pacific cod (*Gadus macrocephalus*)	Shortspine thornyhead (*Sebastolobus alascanus*)	Yellowmouth rockfish (*S. reedi*)	Jack mackerel (*Trachurus symmetricus*)
Pacific whiting (Hake) (*Merluccius productus*)	Pacific Ocean perch (*S. alutus*)	Yellowtail rockfish (*S. flavidus*)	Market squid (*Loligo opalescens*)
Sablefish (*Anoplopoma fimbria*)	Quillback rockfish (*S. maliger*)	Arrowtooth flounder (*Atheresthes stomias*)	
Aurora rockfish (*Sebastes aurora*)	Redbanded rockfish (*S. babcocki*)	Butter sole (*Isopsetta isolepsis*)	**Salmon**
Bank Rockfish (*S. rufus*)	Redstripe rockfish (*S. proriger*)	Curlfin sole (*Pleuronichthys decurrens*)	Coho salmon (*O. kisutch*)
Black rockfish (*S. melanops*)	Rosethorn rockfish (*S. helvomaculatus*)	Dover sole (*Microstomus pacificus*)	Chinook salmon (*O. tshawytscha*)
Blackgill rockfish (*S. melanostomus*)	Rosy rockfish (*S. rosaceus*)	English sole (*Parophrys vetulus*)	

4. LITERATURE CITED

Belt, G.H., J. O'Laughlin and T. Merrill. 1992. Design of forest riparian buffer strips for the protection of water quality: Analysis of scientific literature. Report Number 8, Idaho Forest, Wildlife and Range Policy Analysis Group. 35 p. Avail. College of Forestry, Wildlife and Range Sciences, University of Idaho, Moscow, Idaho.

Berg, L, and T.G. Northcote. 1985. Changes in territorial, gill-flaring, and feeding behavior in juvenile coho salmon (Oncorhynchus kisutch) following short-term pulses of suspended sediment. Can. J. Fish. Aquat. Sci., 42:1410-1417.

Beschta, R.L., R.E. Bilby, G.W. Brown, L.B. Holtby, and T.D. Hofstra. 1987. Stream temperatures and aquatic habitat: fisheries and forestry interactions. *In*: Salo, E.O. and T.W. Cundy (Eds) Streamside Management: forestry and fishery interactions. University of Washington. Seattle. Contribution 57. p. 191-232

Bilby, R.E. and P.A. Bisson. 1998. Function and distribution of large woody debris. P. 324-346 *in*: *River ecology and management: Lessons from the Pacific Coastal Ecoregion*. Edited by R.J. Naiman and R.E. Bilby. Springer, New York.

Bilby, R.E., B.R. Franson, and P.A. Bisson. 1996. Incorporation of nitrogen and carbon from spawning coho salmon into the trophic system of small streams: evidence from stable isotopes. Can. J. Fish. Aquat. Sci. 50:164-173.

Bisson, P.A., R.E. Bilby, M.D. Bryant, C.A. Dolloff, G. B. Grette, R.A. House, M.L. Murphy, K.V. Koski, and J.R. Sedell. 1987. Large woody debris in forested streams in the Pacific Northwest: past, present, and future. Pages 143-190 *in* E.O. Salo and T.W. Cundy, editors. Streamside management: forestry and fishery interactions. Contribution No. 57. Institute of Forest Resources, University of Washington, Seattle.

Brosofske, K. D., J. Chen, R. J. Naiman, and J. F. Franklin. 1997. Harvesting effects on microclimatic gradients from small streams to uplands in western Washington. Ecological Applications 7:1188-1200.

Busby, P., S. Grabowski, R. Iwamoto, C. Mahnken, G. Matthews, M Schiewe, T. Wainwright, R. Waples, J. Williams, C. Wingert, and R. Reisenbichler. 1995. Review of the status of steelhead (*Oncorhynchus mykiss*) from Washington, Idaho, Oregon, and California under the U.S. Endangered Species Act.

Busby, P.J., T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. 1996. Status review of west coast steelhead from Washington, Idaho, Oregon, and California. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-NWFSC-27, 261p.

Carlson, J.Y., C.W. Andrus and H.A. Froehlich. 1990. Woody debris, channel features, and macroinvertebrates of streams with logged and undisturbed riparian timber in northeastern Oregon, U.S.A. Canadian J. of Fisheries and Aquatic Sciences 47:1103-1111.

Casillas, E., L. Crockett, Y. deReynier, J. Glock, M. Helvey, B. Meyer, C. Schmitt, M. Yoklavich, A. Bailey, B. Chao, B. Johnson and T. Pepperell. 1998. Essential Fish Habitat West Coast Groundfish Appendix. National Marine Fisheries Service. Seattle, Washington. 778 p.

Cederholm, C.J., and N.P. Peterson. 1985. The retention of coho salmon (*Oncorhynchus kisutch*) carcasses by organic debris in small streams. Can. J. Fish. Aquat. Sci. 42:1222-1225.

Cederholm, C.J., and M. Reid. 1987. Impact of forest management on coho salmon (*Onchorhynchus kisutch*) populations of the Clearwater River, Washington: A project summary. In *Streamside Management: Forestry and Fishery Interactions*; E. Salo and T. Cundy Eds. Proceedings of a Symposium held at University of Washington, 12-14 February 1986. Contribution no. 57, Institute of Forest Resources, Seattle, Washington. pp. 373-398.

Chen, J., J.F. Franklin, and T.S Spies. 1995. Growing-season microclimate gradients from clearcut edges into old-growth Douglas-fir forests. Ecological Applications 5:74-86.

DAS (Oregon Department of Administrative Services). 1999. Oregon economic and revenue forecast. Vol. XIX. No.2. Office of Economic Analysis, Salem.

Dufour, J. 1995. Effects of main salmon river floatboating activities on Snake River sockeye salmon and Snake River spring/summer chinook salmon. Sawtooth National Recreation Area. Sawtooth National Forest.

FS and BLM (U.S. Forest Service and Bureau of Land Management). 1994. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl; Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl. April.

FEMAT (Forest Ecosystem Management Assessment Team). 1993. Forest ecosystem management; and ecological, economic, and social assessment. Report of the Forest Ecosystem Management Assessment Team. U.S. Government Printing Office 1993-793-071. U.S. Government Printing Office for the U.S.D.A. Forest Service; U.S. Department of Interior, Fish and Wildlife Service, Bureau of Land Management, and National Park Service; U.S. Department of Commerce, National Oceanic and Atmospheric Administration and National Marine Fisheries Service; and the U.S. Environmental Protection Agency.

Furniss, M.J., T.D. Roelofs, and C.S. Yee. 1991. Road construction and maintenance. In *Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats*; W.R. Meehan, ed. Pgs. 297-324. American Fisheries Society Special Pub. 19. Bethesda, MD.

Gregory, S.V., G.A. Lambertti, D.C. Erman, [and others]. 1987. Influence of forest practices on aquatic production. In *Streamside Management: Forestry and Fishery Interactions*; E.O. Salo and T.W. Cundy, eds. Pgs. 233-256. Contribution 57, University of Washington, Institute of Forest Resources. Seattle, WA.

Gregory, S.V., F.J. Swanson, W.A. McKee, and K.W. Cummins. 1991. An ecosystem perspective of riparian zones. BioScience Vol. 41, No. 8, pp 540-551.

Healey, M.C. 1991. Life history of chinook salmon (*Oncorhynchus tshwytscha*). *In*: C. Groot and L. Margolis, editors. *Pacific Salmon Life Histories*. University of British Columbia Press, Vancouver

Hibbs, D.E., P. Giordano and S. Chan. 1992. Vegetation dynamics in managed coastal riparian areas. P. 39-41. In: 1992 Annual Report of the Adaptive Coastal Oregon Productivity Enhancement Program. Adaptive COPE Program, Hatfield Marine Science Center, Oregon State University, Newport.

Hicks, B.J., J.D. Hall, P.A. Bisson, and J.R. Sedell. 1991. Responses of salmonids to habitat changes. In *Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats*; W.R. Meehan, ed. Pgs. 297-324. American Fisheries Society Special Pub. 19. Bethesda, MD.

Johnson, O.W., W.S. Grant, R.G. Cope, K. Neely, F.W. Waknitz, and R..S. Waples. 1997. Status review of chum salmon from Washington, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memo. NMFS-NWFSC-32.

Kostow, K. 1995. Biennial Report on the Status of Wild Fish in Oregon. Oregon Department of Fish and Wildlife. Portland, Oregon.

McDade, M.H., F.J. Swanson, W.A. McKee [and others]. 1990. Source distances for coarse woody debris entering small stream in western Oregon and Washington. Canadian Journal of Forest Research 20:326-330.

McGarry, E.V. 1994. A quantitative analysis and description of the delivery and distribution of large woody debris in Cummins Creek, Oregon. Oregon State University, Corvallis Oregon. M.S. Thesis.

Myers, J.M., R.G.Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grant, F.W. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. Status review of chinook salmon from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memo. NMFS-NWFSC-35.

Murphy, M.L. 1995. Forestry impacts on freshwater habitat of anadromous salmonids in the Pacific Northwest and Alaska -- requirements for protection and restoration. NOAA Coastal Ocean Program Decision Analysis Series No. 7. NOAA Coastal Ocean Office, Silver Spring, MD. 156 pp.

Nickelson, T.E., J.W. Nicholas, A.M. McGie, R.B. Lindsay, D.L. Bottom, R.J. Kaiser, and S.E. Jacobs. 1992. Status of anadromous salmonids in Oregon coastal basins. Oregon Department of Fish and Wildlife, Research Development Section and Ocean Salmon Management, 83 pp. Oregon Department of Fish and Wildlife, P.O. Box 59, Portland.

NOAA Fisheries (National Marine Fisheries Service). 1995. Juvenile Fish Screen Criteria - revised February 16, 1995 (guidelines and criteria for hydroelectric, irrigation, and other water withdrawal projects). (http://www.nwr.noaa.gov/1hydrop/nmfscrit1.htm).

NOAA Fisheries (National Marine Fisheries Service). 1996a. Making endangered species act determinations of effect for individual or grouped actions at the watershed scale. Environmental and Technical Services Division, Habitat Conservation Program.

NOAA Fisheries (National Marine Fisheries Service). 1996b. Addendum: Juvenile Fish Screen Criteria for Pump Intakes - May 9, 1996 (guidelines and criteria for new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/pumpcrit1.htm).

NOAA Fisheries (National Marine Fisheries Service). 1997. Coastal coho factors for decline and protective efforts in Oregon. NOAA Fisheries, Northwest Region, Habitat Conservation Program. 85 pages.

NOAA Fisheries (National Marine Fisheries Service), U.S. Forest Service, Bureau of Land Management, and U.S. Fish and Wildlife Service. 1999. Streamlined consultation procedures for Section 7 of the Endangered Species Act.

NWPPC (Northwest Power Planning Council). 2002. DRAFT Columbia River Basin Fish and Wildlife Program. Willamette River Subbasin Summary.

ODFW and WDFW (Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife). 1998. Status report Columbia River fish runs and fisheries, 1938-1997. Oregon Department of Fish and Wildlife, Portland, Oregon.

ODFW (Oregon Department of Fish and Wildlife). 2000. Guidelines for timing of in-water work to protect fish and wildlife resources. (http://www.dfw.state.or.us/ODFWhtml/InfoCntrHbt/0600_inwtrguide.pdf).

PFMC (Pacific Fishery Management Council). 1998a. Final Environmental Assessment/Regulatory Review for Amendment 11 to the Pacific Coast Groundfish Fishery Management Plan. October 1998.

PFMC (Pacific Fishery Management Council). 1998b. The Coastal Pelagic Species Fishery Management Plan: Amendment 8. Portland, Oregon.

PFMC (Pacific Fishery Management Council). 1999. Amendment 14 to the Pacific Coast Salmon Plan. Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts and Recommended Conservation Measures for Salmon. Portland, Oregon.

Poole, G.C., and C. Berman. 2001. An ecological perspective on in-stream temperature: natural heat dynamics and mechanisms of human-caused thermal degradation. Environmental Management 27(6): 787-802.

Ralph, S.C., G.C. Poole, L.L. Conquest, R.J. Naiman. 1994. Stream channel morphology and woody debris in logged and unlogged basins of western Washington. Can. J. Fish. Aquat. Sci. 51:37-51.

Reeves, G.H., L.E. Benda, K.M. Burnett, [and others]. 1995. A disturbance-based approach to maintaining and restoring freshwater habitats of evolutionarily significant units of anadromous salmonids in the Pacific Northwest. American Fisheries Society Symposium 17:334-349.

Rhodes, J.J., D.A. McCullough, and F.A. Espinosa, Jr. 1994. A coarse screening process for potential application in ESA consultations. Columbia River Intertribal Fish Commission. Prepared under NMFS/BIA Inter-Agency Agreement 40ABNF3. December.

Salo, E.O. 1991. Life history of chum salmon (*Oncorhynchus keta*). *In*: C. Groot and L. Margolis, editors. *Pacific Salmon Life Histories*. University of British Columbia Press, Vancouver.

Sandercock, F.K. 1991. Life history of coho salmon (*Oncorhynchus kisutch*). *In*: Groot, C. and L. Margolis (eds.). 1991. Pacific salmon life histories. Vancouver, British Columbia: University of British Columbia Press.

Sedell, J.R., and R.L. Beschta. 1991. Bringing back the "bio" in bioengineering. In *Fisheries Bioengineering: Proceedings of a Symposium, Bethesda, MD*; J. Colt and S. Dendall, eds. Pgs. 160-175. American Fisheries Society Publication 10. Bethesda, MD.

Spence, B.C., G.A. Lomnicky, R.M. Hughes, and R.P. Novitzki. 1996. An Ecosystem Approach to Salmonid Conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, Oregon. (Available from the National Marine Fisheries Service, Portland, Oregon). 356 p.

Sullivan, K., T.E. Lisle, C.A. Dolloff, G.E. Grant, and L.M. Reid. 1987. Stream channels: the link between forests and fishes. In *Streamside Management: Forestry and Fishery Interactions*; E.O. Salo and T.W. Cundy, eds. Pgs. 191-232. Contribution 57, University of Washington, Institute of Forest Resources. Seattle, WA.

Swanston, D.N. 1991. Natural processes. In *Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats*; W.R. Meehan, ed. Pgs. 139-179. American Fisheries Society Special Pub. 19. Bethesda, MD.

Weitkamp, L.A., T.C. Wainwright, G.J. Bryant, G.B. Milner, D.J. Teel, R.G. Kope, and R.S. Waples. 1995. Status review of coho salmon from Washington, Oregon, and California. U.S. Dep. Commer., NOAA Technical Memorandum NMFS-NWFSC-24. September.

APPENDIX A

Watershed Baseline and Projected Activity Tables, FY 2003-2007

(adapted from Table 6 of the BA)

Watershed Baseline and Projected Activities
Five Year Estimate (FY 2003-2007) by Annual Average by 5th Field Watershed

(Adapted from Table 6 of the BA)

Baseline Data						Activity Levels																											
Subasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
Middle Columbia/Hood	Fifteenmile Creek 1707010502	Mt. Hood NF	14,750	62	16	20	20	1	2	0	4	5	15	1	2	1	2	25	10	0	20	0	25	0	5	1	0	10	20	0	0	0	2
		Prineville BLM	65	0	0																												
		Non-FS or BLM	142,356	386	5																												
		TOTAL	157,170	448	21	20	20	1	2	0	4	5	15	1	2	1	2	25	10	0	20	0	25	0	5	1	0	10	20	0	0	0	2
	Fivemile Creek 1707010503	Mt. Hood NF	18,258	104	11	20	20	1	2	0	2	5	15	1	2	1	2	25	10	0	40	0	25	0	5	1	1	10	20	0	0	0	2
		Prineville BLM	543	0	0																												
		Non-FS or BLM	59,356	185	0																												
		TOTAL	78,157	289	11	20	20	1	2	0	2	5	15	1	2	1	2	25	10	0	40	0	25	0	5	1	1	10	20	0	0	0	2
	Middle Columbia / Mill Creek 1707010504	Mt. Hood NF	13,578	53	4	10	10	1	2	0	2	5	25	1	1	1	2	5	5	0	10	0	10	0	3	0	0	5	15	0	0	0	1
		CRGN Scenic Area	761	2	0	1	0	1	0	0	0	5	0	0	0	0	1	0	0	2	0	5	0	3	5	0	0	5	0	3	0	0	0
		Prineville BLM	1,896	0	0																												
		Non-FS or BLM	114,406	449	1																												
		TOTAL	130,642	504	5	11	10	2	2	0	2	10	25	1	1	1	3	5	5	2	10	5	10	3	8	0	0	10	15	3	0	0	1
	Mosier Creek 1707010505	Mt. Hood NF	829	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Prineville BLM	371	0	0																												
		Non-FS or BLM	41,200	161	2																												
		TOTAL	42,400	164	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	East Fork Hood River 1707010506	Mt. Hood NF	70,560	207	87	30	50	5	10	0	4	10	40	0	3	0	4	100	50	0	20	0	35	0	5	2	4	10	40	0	0	0	3
		Prineville BLM	200	0	0																												
		Non-FS or BLM	30,047	223	2																												
		TOTAL	100,807	430	89	30	50	5	10	0	4	10	40	2	3	2	4	100	50	0	20	0	35	0	5	2	4	10	40	0	0	0	3
	West Fork Hood River 1707010507	Mt. Hood NF	44,053	151	25	30	45	5	5	0	6	10	30	2	3	2	2	40	60	0	20	0	20	0	3	1	2	10	40	0	0	0	3
		Non-FS or BLM	21,386	148	0																												
		TOTAL	65,438	331	25	30	45	5	5	0	6	10	30	2	3	2	2	40	60	0	20	0	20	0	3	1	2	10	40	0	0	0	3
	Hood River 1707010508	Mt. Hood NF	5,950	34	1	10	10	2	4	0	1	5	15	1	3	1	1	0	0	0	10	0	4	0	3	1	1	10	20	0	0	0	1
		Prineville BLM	162	0	0																												
		Non-FS or BLM	45,155	288	0																												
		TOTAL	51,267	322	1	10	10	2	4	0	1	5	15	1	3	1	1	0	0	0	10	0	4	0	3	1	1	10	20	0	0	0	1
	Middle Columbia / Grays Creek 1707010512	Mt. Hood NF	2,242	1	10	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CRGN Scenic Area	11,013	6	11	3	1	1	0	1	2	10	15	0	1	0	1	8	0	0	1	15	6	3	5	1	0	15	0	11	0	0	0
		Non-FS or BLM	79,428	116	7																												
		TOTAL	92,683	123	28	3	1	1	0	1	2	10	15	0	1	0	1	9	0	0	1	15	6	3	5	1	0	15	0	11	0	0	0
	Middle Columbia/Eagle Creek 1707010513	Mt. Hood NF	32,744	8	53	1	0	0	0	0	0	0	0	0	0	0		8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CRGN Scenic Area	7,888	7	15	4	1	1	0	1	2	10	15	0	1	0	1	10	2	5	6	15	6	3	5	0	0	15	0	32	0	0	0
		Non-FS or BLM	43,829	27	0																												
		TOTAL	84,460	42	68	5	1	1	0	1	2	10	15	0	1	0	1	18	5	5	6	15	6	3	5	0	0	15	0	32	0	0	0

Vertically barred rows indicate that ESA coverage is not being requested for that watershed. Hash-marked rows indicate that listed fish are not present in that watershed.

Watershed Baseline and Projected Activities
Five Year Estimate (FY 2003-2007) by Annual Average by 5th Field Watershed

(Adapted from Table 6 of the BA)

Baseline Data						Activity Levels																											
Subasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
Lower Columbia/Sandy	Salmon River 1708000101	Salem BLM	1,284	4	0	1	0	0	0	0	1	5	0	0	0	1	1	2	0	200	0	1	0	0	0	2	0	15	0	0	0	0	0
		Mt. Hood NF	67,382	110	12	30	30	20	7	5	2	30	20	5	1	3	2	80	80	5	11	10	20	2	1	2	1	50	20	0	0	1	1
		Non-FS or BLM	5,019	38	3																												
		TOTAL	73,684	152	15	31	30	20	7	5	3	35	20	5	1	4	3	82	80	205	11	11	20	2	1	4	1	65	20	0	0	1	1
	Zigzag River 1708000102	Mt. Hood NF	36,535	57	10	60	50	20	10	4	2	40	30	5	1	3	2	40	25	5	3	8	22	5	1	3	1	40	30	300	0	1	1
		Non-FS or BLM	1,213	22	0																												
		TOTAL	37,748	79	10	60	50	20	10	4	2	40	30	5	1	3	2	40	25	5	3	8	22	5	1	3	1	40	30	300	0	1	1
	Upper Sandy River 1708000103	Mt. Hood NF	30,721	74	15	60	50	20	10	6	3	40	30	4	2	3	3	80	70	20	10	8	25	5	2	2	2	40	30	10	0	1	1
		Non-FS or BLM	3,464	15	0																												
		TOTAL	34,185	89	15	60	50	20	10	6	3	40	30	4	2	3	3	80	70	20	10	8	25	5	2	2	2	40	30	10	0	1	1
	Middle Sandy River 1708000104	Salem BLM	3,841	37	0	15	5	1	0	0	1	30	0	1	1	1	1	2	0	0	0	1	0	1	0	0	0	25	0	0	0	1	0
		Mt. Hood NF	7,226	24	0	5	5	10	3	1	1	20	10	3	1	2	1	20	12	5	3	3	20	3	2	1	1	15	10	5	0	1	1
		Non-FS or BLM	29,872	202	0																												
		TOTAL	40,939	263	0	20	10	11	3	1	2	50	10	4	2	3	2	22	12	5	3	4	20	4	2	1	1	40	10	5	0	2	1
	Bull Run River 1708000105	Salem BLM	372	6	0	2	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0
		Mt. Hood NF	77,733	280	2	40	60	40	5	1	1	5	5	2	1	4	1	10	5	10	5	10	4	4	1	1	1	5	1	0	0	5	0
		Non-FS or BLM	10,842	54	0																												
		TOTAL	88,947	340	2	42	60	40	5	1	1	5	5	2	1	5	2	10	5	10	5	10	4	4	1	1	1	30	1	0	0	5	0
	Columbia Gorge Tributaries 1708000107	CRGN Scenic Area	21,754	31	35	11	3	1	0	1	2	15	15	0	2	1	1	29	6	3	7	15	4	3	5	0	0	20	15	7	0	0	0
		Mt. Hood NF	10,095	13	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	72,033	117	0																												
		TOTAL	103,882	161	40	11	3	1	0	1	2	15	15	0	2	1	1	30	6	3	7	15	4	3	5	0	0	20	15	7	0	0	0
	Lower Sandy River 1708000108	CRGN Scenic Area	737	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	3,656	12	0	4	1	0	0	0	0	5	0	0	0	1	1	2	0	50	0	0	0	0	0	1	0	25	0	0	0	0	0
		Mt. Hood NF	3,088	16	0	3	1	5	5	1	1	10	10	1	1	0	1	5	2	1	1	10	5	1	1	0	0	1	1	0	0	1	1
		Non-FS or BLM	39,655	330	0																												
		TOTAL	47,135	359	0	7	2	5	5	1	1	15	10	1	1	1	2	7	2	51	1	10	5	1	1	1	0	26	1	0	0	1	1
Lower Columbia / Clatskanie	Beaver Cr / Columbia R. 1708000302	Non-FS or BLM	97,390	653	2																												
		TOTAL	97,390	653	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Clatskanie River 1708000303	Salem BLM	702	6	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	50	0	0	0	0	1
		Non-FS or BLM	60,755	514	8																												
		TOTAL	61,457	520	8	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	50	0	0	0	0	1
	Plympton Creek 1708000306	Non-FS or BLM	31,493	215	4																												
		TOTAL	31,493	215	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower Columbia	Youngs River 1708000601	Non-FS or BLM	134,671	949	50																												
		TOTAL	134,671	949	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Big Creek 1708000602	Non-FS or BLM	74,678	548	5																												
		TOTAL	74,678	548	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Vertically barred rows indicate that ESA coverage is not being requested for that watershed. Hash-marked rows indicate that listed fish are not present in that watershed.

Watershed Baseline and Projected Activities
Five Year Estimate (FY 2003-2007) by Annual Average by 5th Field Watershed

(Adapted from Table 6 of the BA)

Baseline Data						Activity Levels																											
Subasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
Middle Fork Willamette	Upper Middle Fork Willamette River 1709000101	Willamette NF	101,980	359	32	46	4	10	2	5	0	3	0	0	5	5	0	60	0	50	0	20	0	60	0	3	1	0	0	6	3	1	0
		Non-FS or BLM	11,571	62	0																												
		TOTAL	113,551	421	32	46	4	10	2	5	0	3	0	0	5	5	0	60	0	50	0	20	0	60	0	3	1	0	0	6	3	1	0
	Hills Creek 1709000102	Willamette NF	36,304	167	5	28	2	2	0	2	0	1	0	0	2	2	0	20	0	10	0	1	0	55	0	3	0	0	0	1	0	0	0
		Non-FS or BLM	2,124	12	0																												
		TOTAL	38,428	179	5	28	2	2	0	2	0	1	0	0	2	2	0	20	0	10	0	1	0	55	0	3	0	0	0	1	0	0	0
	Salt Creek / Willamette River 1709000103	Willamette NF	72,255	159	58	18	2	2	0	4	0	1	0	0	4	4	0	45	0	50	0	2	0	60	0	3	1	0	0	8	2	1	0
		Non-FS or BLM	1,012	25	0																												
		TOTAL	73,267	184	58	18	2	2	0	4	0	1	0	0	4	4	0	45	0	50	0	2	0	60	0	3	1	0	0	8	2	1	0
	Salmon Creek 1709000104	Willamette NF	80,382	260	43	27	3	2	0	4	0	1	0	0	4	4	0	60	0	10	0	2	0	60	0	3	1	0	0	5	2	1	0
		Non-FS or BLM	2,014	22	1																												
		TOTAL	82,396	282	44	27	3	2	0	4	0	1	0	0	4	4	0	60	0	10	0	2	0	60	0	3	1	0	0	5	2	1	0
	Hills Creek Reservoir 1709000105	Willamette NF	87,741	325	16	10	1	1	0	0	0	1	0	0	1	1	0	3	0	60	0	2	0	20	0	2	0	0	0	2	1	1	0
		Umpqua NF	676	4	0																												
		Non-FS or BLM	21,447	133	2																												
		TOTAL	109,865	462	18	10	1	1	0	0	0	1	0	0	1	1	0	3	0	60	0	2	0	20	0	2	0	0	0	2	1	1	0
	North Fork Of Middle Fork Willamette 1709000106	Willamette NF	148,669	463	115	37	3	10	2	4	0	3	0	0	5	5	0	160	0	125	0	6	0	60	0	4	1	0	0	5	2	1	0
		Non-FS or BLM	10,308	23	4																												
		TOTAL	158,977	486	119	37	3	10	2	4	0	3	0	0	5	5	0	160	0	125	0	6	0	60	0	4	1	0	0	5	2	1	0
	Middle Fork Willamette / Lookout Point 1709000107	Willamette NF	43,846	123	12	55	5	5	2	4	0	3	0	0	4	4	0	75	0	100	0	8	0	60	0	4	0	500	0	8	2	1	0
		Umpqua NF	95	0	0																												
		Eugene BLM	14,206	97	0	56	24	4	4	2	3	8	8	4	4	16	16	0	0	1	1	12	12	2	2	3	3	80	8	1	0	2	2
		Non-FS or BLM	43,727	302	3																												
		TOTAL	101,873	522	15	111	29	9	6	6	3	11	8	4	8	20	16	75	0	101	1	20	12	62	2	7	3	580	8	9	2	3	2
	Little Fall Creek 1709000108	Willamette NF	6,275	33	0	2	1	0	0	1	0	0	0	0	1	1	0	2	0	10	0	2	0	20	0	1	0	0	0	2	0	0	0
		Eugene BLM	2,285	19	0	15	3	2	2	2	2	5	5	3	3	7	7	0	0	0	0	10	10	2	2	1	1	300	5	1	0	1	1
		Non-FS or BLM	28,889	236	0																												
		TOTAL	37,449	288	0	17	4	2	2	3	2	5	5	3	4	8	7	2	0	10	0	12	10	22	2	2	1	300	5	3	0	1	1
	Fall Creek 1709000109	Willamette NF	94,475	519	32	27	3	10	2	3	0	1	0	0	3	3	0	50	0	60	0	5	0	45	0	3	1	0	0	6	3	0	0
		Eugene BLM	4,412	31	0	15	5	3	3	1	2	5	5	3	3	5	5	0	0	0	0	10	10	2	2	1	1	400	5	1	0	1	1
		Non-FS or BLM	24,599	138	1																												
		TOTAL	123,485	688	33	42	8	13	5	4	2	6	5	3	6	8	5	50	0	60	0	15	10	47	2	4	2	400	5	7	3	1	1
	Lower Middle Fork Willamette River 1709000110	Eugene BLM	4,697	22	0	14	6	1	1	1	1	2	2	1	1	4	4	0	0	0	0	3	3	1	1	0	0	20	2	0	0	1	1
		Non-FS or BLM	31,299	248	3																												
		TOTAL	35,996	270	3	14	6	1	1	1	1	2	2	1	1	4	4	0	0	0	0	3	3	1	1	0	0	20	2	0	0	1	1

Vertically barred rows indicate that ESA coverage is not being requested for that watershed. Hash-marked rows indicate that listed fish are not present in that watershed.

Watershed Baseline and Projected Activities
Five Year Estimate (FY 2003-2007) by Annual Average by 5th Field Watershed

(Adapted from Table 6 of the BA)

Baseline Data						Activity Levels																									
Subasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
Coast Fork Willamette	Row River 1709000201	Umpqua NF	86,806	364	39																												
		Eugene BLM	20,357	128	1	27	9	1	1	0	1	5	5	0	1	2	1	3	0	0	0	2	1	7	3	1	1	96	0	5	0	0	0
		Non-FS or BLM	71,536	735	0																												
		TOTAL	178,698	1,227	40	27	9	1	1	0	1	5	5	0	1	2	1	3	0	0	0	2	1	7	3	1	1	96	0	5	0	0	0
	Mosby Creek 1709000202	Eugene BLM	16,736	105	0	39	13	1	1	0	2	15	15	0	2	3	1	1	0	4	0	2	4	15	5	1	1	312	0	3	0	0	0
		Non-FS or BLM	44,190	452	0																												
		TOTAL	60,927	557	0	39	13	1	1	0	2	15	15	0	2	3	1	1	0	4	0	2	4	15	5	1	1	312	0	3	0	0	0
	Upper Coast Fork Willamette River 1709000203	Eugene BLM	24,931	196	0	72	24	3	1	0	4	20	20	0	3	5	2	0	0	0	0	2	7	11	4	3	1	456	0	3	0	0	0
		Non-FS or BLM	72,829	778	0																												
		TOTAL	97,761	974	0	72	24	3	1	0	4	20	20	0	3	5	2	0	0	0	0	2	7	11	4	3	1	456	0	3	0	0	0
	Lower Coast Fork Willamette River 1709000205	Eugene BLM	5,272	42	1	27	8	3	3	1	3	10	10	2	3	7	6	0	0	0	0	7	6	8	4	2	2	192	0	3	0	1	1
		Non-FS or BLM	83,768	628	21																												
		TOTAL	89,040	670	22	27	8	3	3	1	3	10	10	2	3	7	6	0	0	0	0	7	6	8	4	2	2	192	0	3	0	1	1
Upper Willamette	Long Tom River 1709000301	Eugene BLM	20,626	140	2																												
		Non-FS or BLM	242,194	1,952	33																												
		TOTAL	262,819	2,092	35																												
	Muddy Creek 1709000302	Eugene BLM	2,734	21	0	8	2	2	2	1	0	5	5	3	3	5	5	0	0	0	0	1	1	1	1	1	1	100	5	1	0	1	1
		Non-FS or BLM	248,161	1,462	4																												
		TOTAL	250,894	1,483	4	8	2	2	2	1	0	5	5	3	3	5	5	0	0	0	0	1	1	1	1	1	1	100	5	1	0	1	1
	Calapooia River 1709000303	Willamette NF	5,900	34	3	10	5	0	0	0	0	0	0	0	0	10	5	0	0	0	0	0	1	2	1	1	0	100	50	2	0	0	0
		Salem BLM	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Eugene BLM	8,672	53	0	40	15	5	5	1	1	5	5	2	2	5	5	0	0	0	0	2	2	2	2	1	1	300	5	5	0	1	1
		Non-FS or BLM	168,886	959	3																												
		TOTAL	183,495	1,046	6	50	20	5	5	1	1	5	5	2	2	15	10	0	0	0	0	2	3	4	3	2	1	400	55	7	0	1	1
	Oak Creek 1709000304	Non-FS or BLM	104,304	624	4																												
		TOTAL	104,304	624	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Marys River 1709000305	Siuslaw NF	8,838	49	0																												
		Salem BLM	6,438	46	3																												
		Non-FS or BLM	178,241	1,238	41																												
		TOTAL	193,517	1,333	44																												
	Luckiamute River 1709000306	Siuslaw NF	329	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	8,818	38	2	20	10	1	0	1	0	25	0	1	0	10	0	2	0	0	0	1	0	0	0	1	0	250	0	2	0	0	0
		Non-FS or BLM	192,360	1,129	76																												
		TOTAL	201,507	1,167	78	20	10	1	0	1	0	25	0	1	0	10	0	2	0	0	0	1	0	0	0	1	0	250	0	2	0	0	0

Vertically barred rows indicate that ESA coverage is not being requested for that watershed. Hash-marked rows indicate that listed fish are not present in that watershed.

Watershed Baseline and Projected Activities
Five Year Estimate (FY 2003-2007) by Annual Average by 5th Field Watershed

(Adapted from Table 6 of the BA)

Baseline Data						Activity Levels																											
Subasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
McKenzie	Upper Mckenzie River 1709000401	Willamette NF	222,682	545	219	145	1	20	20	0	5	150	15	0	4	20	5	178	2	147	16	50	50	22	19	16	0	8,773	30	100	60	6	2
		Non-FS or BLM	7,845	124	3																												
		TOTAL	230,527	669	222	145	1	20	20	0	5	150	15	0	4	20	5	178	2	147	16	50	50	22	19	16	0	8,773	30	100	60	6	2
	Horse Creek 1709000402	Willamette NF	100,061	90	119	50	3	20	20	0	5	100	5	0	4	20	5	149	1	13	1	50	50	3	2	5	0	290	10	100	43	6	2
		Non-FS or BLM	1,705	9	0																												
		TOTAL	101,767	99	119	50	3	20	20	0	5	100	5	0	4	20	5	149	1	13	1	50	50	3	2	5	0	290	10	100	43	6	2
	South Fork Mckenzie River 1709000403	Willamette NF	128,930	222	154	90	1	20	20	0	5	50	5	0	4	20	5	83	2	462	51	50	50	27	19	22	0	3,130	30	100	4	6	2
		Non-FS or BLM	8,980	53	4																												
		TOTAL	137,910	275	158	90	1	20	20	0	5	50	5	0	4	20	5	83	2	462	51	50	50	27	19	22	0	3,130	30	100	4	6	2
	Blue River 1709000404	Willamette NF	52,437	223	16																												
		Non-FS or BLM	6,548	35	5																												
		TOTAL	58,986	258	21																												
	Mckenzie River/Quartz Creek 1709000405	Willamette NF	21,813	90	2	65	0	20	20	0	5	75	5	0	4	20	5	10	0	0	0	50	50	7	0	6	0	300	0	100	0	6	2
		Non-FS or BLM	25,894	151	0																												
		TOTAL	47,707	241	2	65	0	20	20	0	5	75	5	0	4	20	5	10	0	0	0	50	50	7	0	6	0	300	0	100	0	6	2
	Mohawk River 1709000406	Eugene BLM	26,954	192	0	50	25	5	5	2	5	15	15	5	5	15	15	100	5	163	163	15	15	4	4	2	2	800	10	4	0	2	2
		Non-FS or BLM	87,558	533	2																												
		TOTAL	114,511	725	2	50	25	5	5	2	5	15	15	5	5	15	15	100	5	163	163	15	15	4	4	2	2	800	10	4	0	2	2
	Lower Mckenzie River 1709000407	Willamette NF	7,126	5	0	3	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	1	0	3	0	2	0	225	0	5	0	0	0
		Eugene BLM	25,377	117	0	50	25	10	10	5	10	40	40	5	5	15	15	1	1	0	60	15	15	5	5	2	2	800	10	1	0	2	2
		Non-FS or BLM	132,377	946	2																												
		TOTAL	164,879	1,068	2	53	25	10	10	5	10	41	40	5	5	17	15	1	1	0	60	16	15	8	5	4	2	1,025	10	6	0	2	2
North Santiam	Upper North Santiam River 1709000501	Willamette NF	133,580	395	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	12,979	90	2																												
		TOTAL	146,559	485	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	North Fork Breitenbush River 1709000502	Willamette NF	60,677	226	21																												
		Mt. Hood NF	7,294	6	5																												
		Non-FS or BLM	1,417	4	0																												
		TOTAL	69,388	236	26																												
	Detroit Reservoir / Blow Out Divide Creek 1709000503	Willamette NF	52,233	267	10																												
		Non-FS or BLM	19,202	97	2																												
		TOTAL	71,435	364	12																												
	Middle North Santiam River 1709000504	Willamette NF	552	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	6,179	41	3	15	5	1	0	0	0	5	0	1	1	1	0	2	0	100	5	0	0	1	0	0	0	75	0	0	0	0	0
		Non-FS or BLM	49,924	421	2																												
		TOTAL	56,655	468	5	15	5	1	0	0	0	5	0	1	1	1	0	2	0	100	5	0	0	1	0	0	0	75	0	0	0	0	0
	Little North Santiam River 1709000505	Willamette NF	36,093	51	32	10	3	1	0	0	0	0	0	0	0	5	2	28	6	2	1	0	1	10	2	1	0	0	0	2	1	0	0
		Salem BLM	13,160	79	1	30	5	2	0	0	1	10	0	1	1	3	1	2	0	50	2	10	0	1	0	1	0	200	0	0	0	0	0
		Non-FS or BLM	23,108	201	1																												
		TOTAL	72,361	331	34	40	8	3	0	0	1	10	0	1	1	8	3	30	6	52	3	10	1	11	2	2	0	200	0	2	1	0	0
	Lower North Santiam River 1709000506	Salem BLM	1,006	8	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
		Non-FS or BLM	71,231	396	3																												
		TOTAL	72,237	404	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0

Vertically barred rows indicate that ESA coverage is not being requested for that watershed. Hash-marked rows indicate that listed fish are not present in that watershed.

Watershed Baseline and Projected Activities
Five Year Estimate (FY 2003-2007) by Annual Average by 5th Field Watershed

(Adapted from Table 6 of the BA)

Baseline Data						Activity Levels																											
Subasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
South Santiam	Hamilton Creek / South Santiam River 1709000601	Salem BLM	4,819	38	0	20	5	0	0	0	0	5	0	1	0	1	0	0	0	0	0	0	0	1	0	2	0	50	0	0	0	0	0
		Non-FS or BLM	113,279	762	22																												
		TOTAL	118,099	800	22	20	5	0	0	0	0	5	0	1	0	1	0	0	0	0	0	0	0	1	0	2	0	50	0	0	0	0	0
	Crabtree Creek 1709000602	Salem BLM	17,594	135	0	35	5	2	0	0	1	5	0	0	0	1	0	0	0	0	0	3	0	1	0	1	0	75	0	0	0	0	0
		Non-FS or BLM	82,385	498	1																												
		TOTAL	99,979	633	1	35	5	2	0	0	1	5	0	0	0	1	0	0	0	0	0	3	0	1	0	1	0	75	0	0	0	0	0
	Thomas Creek 1709000603	Willamette NF	342	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	12,952	100	0	35	5	0	0	0	1	5	0	0	0	1	0	0	0	0	0	3	0	1	0	2	0	100	0	0	0	0	0
		Non-FS or BLM	79,245	549	4																												
		TOTAL	92,539	653	4	35	5	0	0	0	1	5	0	0	0	1	0	0	0	0	0	3	0	1	0	2	0	100	0	0	0	0	0
	Quartzville Creek 1709000604	Willamette NF	35,521	154	10																												
		Salem BLM	30,253	193	1																												
		Non-FS or BLM	43,633	338	19																												
		TOTAL	109,407	685	30																												
	Middle Santiam River 1709000605	Willamette NF	42,903	139	41																												
		Non-FS or BLM	23,771	218	6																												
		TOTAL	66,674	357	47																												
	South Santiam River 1709000606	Willamette NF	67,933	250	39	20	5	0	0	0	0	100	2	0	0	0	1	10	0	0	20	0	4	5	2	4	1	200	100	3	1	1	0
		Non-FS or BLM	33,776	286	6																												
		TOTAL	101,709	536	45	20	5	0	0	0	0	100	2	0	0	0	1	10	0	0	20	0	4	5	2	4	1	200	100	3	1	1	0
	Lower South Santiam River 1709000607	Willamette NF	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	434	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	36,196	287	39																												
		TOTAL	36,646	287	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Wiley Creek 1709000608	Willamette NF	2,980	10	1	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	40	10	0	0	0	0
		Eugene BLM	97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	37,575	244	20																												
		TOTAL	40,651	254	21	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	40	10	0	0	0	0
Middle Willamette	Mill Creek / Willamette River 1709000701	Salem BLM	364	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	71,872	447	1																												
		TOTAL	72,237	448	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rickreall Creek 1709000702	Siuslaw NF	1,030	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	3,308	20	0	1	0	1	0	1	0	0	0	1	0	5	0	0	0	0	0	1	0	1	0	1	0	145	0	2	0	0	0
		Non-FS or BLM	119,510	641	7																												
		TOTAL	123,848	669	7	1	0	1	0	1	0	0	0	1	0	5	0	0	0	0	0	1	0	1	0	1	0	145	0	2	0	0	0
	Willamette River / Chehalem Creek 1709000703	Non-FS or BLM	172,177	1,221	12																												
		TOTAL	172,177	1,221	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Abernethy Creek 1709000704	Salem BLM	280	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	86,406	709	12																												
		TOTAL	86,686	710	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Vertically barred rows indicate that ESA coverage is not being requested for that watershed. Hash-marked rows indicate that listed fish are not present in that watershed.

Watershed Baseline and Projected Activities
Five Year Estimate (FY 2003-2007) by Annual Average by 5th Field Watershed

(Adapted from Table 6 of the BA)

Baseline Data						Activity Levels																											
Subasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
Yamhill	Upper South Yamhill River 1709000801	Siuslaw NF	5,515	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	11,376	24	0	0	5	0	0	0	1	2	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	90	3	0	0	0	1
		Non-FS or BLM	72,519	495	20																												
		TOTAL	89,410	561	20	0	5	0	0	0	1	2	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	90	3	0	0	0	1
	Willamina Creek 1709000802	Siuslaw NF	988	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	16,967	117	0	0	10	0	2	0	2	20	0	0	1	0	5	0	2	0	3	3	3	0	3	0	2	340	3	2	0	0	1
		Non-FS or BLM	35,782	277	0																												
		TOTAL	53,737	401	0	0	10	0	2	0	2	20	0	0	1	0	5	0	2	0	3	3	3	0	3	0	2	340	3	2	0	0	1
	Mill Creek/South Yamhill River 1709000803	Siuslaw NF	115	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	12,332	76	0	30	20	2	0	1	1	50	0	1	0	20	0	0	0	8	0	2	0	0	0	1	0	130	0	0	0	0	0
		Non-FS or BLM	21,751	120	0																												
		TOTAL	34,198	197	0	30	20	2	0	1	1	50	0	1	0	20	0	0	0	8	0	2	0	0	0	1	0	130	0	0	0	0	0
	Lower South Yamhill River 1709000804	Salem BLM	1,491	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		Non-FS or BLM	74,489	332	2																												
		TOTAL	75,981	338	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Salt Creek / South Yamhill River 1709000805	Salem BLM	106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	62,550	229	1																												
		TOTAL	62,657	229	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	North Yamhill River 1709000806	Salem BLM	12,477	78	0	0	10	0	5	0	1	2	0	0	0	0	3	0	2	0	2	3	1	0	2	0	0	400	3	1	0	0	1
		Non-FS or BLM	100,974	712	7																												
		TOTAL	113,451	790	7	0	10	0	5	0	1	2	0	0	0	0	3	0	2	0	2	3	1	0	2	0	0	400	3	1	0	0	1
	Yamhill River 1709000807	Non-FS or BLM	64,025	335	1																												
		TOTAL	64,025	335	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mollala/Pudding	Abiqua Creek / Pudding River 1709000901	Salem BLM	2,170	11	0	6	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	50	0	0	0	0	0
		Non-FS or BLM	176,214	1,083	23																												
		TOTAL	178,383	1,094	23	6	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	50	0	0	0	0	0
	Butte Creek / Pudding River 1709000902	Salem BLM	3,815	21	0	4	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	50	0	0	0	0	0
		Non-FS or BLM	66,615	417	0																												
		TOTAL	70,431	438	0	4	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	50	0	0	0	0	0
	Rock Creek / Pudding River 1709000903	Salem BLM	1,408	6	0	4	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	25	0	0	0	0	0
		Non-FS or BLM	53,333	290	4																												
		TOTAL	54,741	296	4	4	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	25	0	0	0	0	0
	Senecal Creek / Mill Creek 1709000904	Non-FS or BLM	34,064	240	0																												
		TOTAL	34,064	240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Upper Molalla River 1709000905	Mt. Hood NF	1,731	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Willamette NF	555	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	35,110	264	0	120	30	9	1	0	1	10	0	0	0	2	1	14	1	15	1	10	0	1	0	2	0	300	0	0	0	0	0
		Non-FS or BLM	91,809	745	7																												
		TOTAL	129,205	1,015	7	120	30	9	1	0	1	10	0	0	0	2	1	14	1	15	1	10	0	1	0	2	0	300	0	0	0	0	0
	Lower Molalla River 1709000906	Mt. Hood NF	236	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	3,504	31	0	5	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	50	0	0	0	0	0
		Non-FS or BLM	88,802	615	6																												
		TOTAL	92,543	650	6	5	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	50	0	0	0	0	0

Vertically barred rows indicate that ESA coverage is not being requested for that watershed. Hash-marked rows indicate that listed fish are not present in that watershed.

Watershed Baseline and Projected Activities
Five Year Estimate (FY 2003-2007) by Annual Average by 5th Field Watershed

(Adapted from Table 6 of the BA)

Baseline Data						Activity Levels																											
Subasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
Tualatin	Dairy Creek 1709001001	Salem BLM	6,581	32	0	0	0	0	0	0	1	10	0	0	1	0	2	0	0	0	0	3	2	0	3	0	0	190	1	0	0	0	1
		Non-FS or BLM	141,188	917	40																												
		TOTAL	147,769	949	40	0	0	0	0	0	1	10	0	0	1	0	2	0	0	0	0	3	2	0	3	0	0	190	1	0	0	0	1
	Gales Creek 1709001002	Non-FS or BLM	60,274	375	11																												
		TOTAL	60,274	375	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Scoggins Creek 1709001003	Salem BLM	3,937	7	1	0	0	0	0	0	0	4	0	0	1	0	1	0	1	0	0	1	1	0	3	0	0	100	3	0	0	0	1
		Non-FS or BLM	83,023	440	31																												
		TOTAL	86,961	447	32	0	0	0	0	0	0	4	0	0	1	0	1	0	1	0	0	1	1	0	3	0	0	100	3	0	0	0	1
	Rock Creek/Tualatin River 1709001004	Salem BLM	239	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	90	0	0	0	0	1
		Non-FS or BLM	96,501	1,099	4																												
		TOTAL	96,740	1,099	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	90	0	0	0	0	1
	Lower Tualatin River 1709001005	Non-FS or BLM	61,552	939	3																												
		TOTAL	61,552	939	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower Willamette	Collawash River 1709001101	Mt. Hood NF	93,160	370	18	150	25	2	4	0	5	3	2	2	2	2	5	11	11	0	10	1	10	2	2	2	2	800	0	10	0	2	0
		Willamette NF	3,283	8	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Salem BLM	903	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	34	0	0																												
		TOTAL	97,380	384	23	150	25	2	4	0	5	3	2	2	2	2	5	11	11	0	10	1	10	2	2	2	2	800	0	10	0	2	0
	Upper Clackamas River 1709001102	Mt. Hood NF	94,203	488	3	200	25	2	4	0	5	4	2	2	2	3	3	20	19	0	20	1	12	2	5	3	2	800	0	20	0	1	0
		Non-FS or BLM	6,251	12	7																												
		TOTAL	100,454	500	10	200	25	2	4	0	5	4	2	2	2	3	3	20	19	0	20	1	12	2	5	3	2	800	0	20	0	1	0
	Oak Grove Fork Clackamas River 1709001103	Mt. Hood NF	77,760	440	12	175	25	2	4	0	3	3	2	3	2	3	3	5	5	0	20	1	12	2	2	2	2	800	0	0	0	0	0
		Non-FS or BLM	12,743	43	3																												
		TOTAL	90,504	483	15	175	25	2	4	0	3	3	2	3	2	3	3	5	5	0	20	1	12	2	2	2	2	800	0	0	0	0	0
	Middle Clackamas River 1709001104	Mt. Hood NF	126,164	506	0	130	25	2	4	0	4	4	2	1	2	2	3	20	18	0	40	1	10	2	2	2	2	800	0	20	0	1	0
		Salem BLM	3,498	26	0	4	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0	15	0	0	0	0	0
		Non-FS or BLM	8,785	91	4																												
		TOTAL	138,447	623	4	134	26	3	4	0	4	4	2	1	2	3	4	20	18	0	40	1	10	3	2	3	2	815	0	20	0	1	0
	Eagle Creek 1709001105	Mt. Hood NF	17,247	32	0	20	2	2	1	0	2	2	0	1	1	2	1	1	3	0	2	1	0	2	1	1	1	200	0	0	0	0	0
		Salem BLM	4,076	13	0	4	1	1	0	0	1	10	0	0	0	1	1	0	0	0	0	3	0	1	0	1	0	25	0	0	0	0	0
		Non-FS or BLM	36,264	281	3																												
		TOTAL	57,587	326	3	24	3	3	1	0	3	12	0	1	1	3	2	1	3	0	2	4	0	3	1	2	1	225	0	0	0	0	0
	Lower Clackamas River 1709001106	Mt. Hood NF	1,732	13	0																												
		Salem BLM	4,977	32	0	2	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	30	0	0	0	0	0
		Non-FS or BLM	110,902	899	0																												
		TOTAL	117,611	944	0	2	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	30	0	0	0	0	0
	Johnson Creek 1709001201	Salem BLM	0	0	0																												
		Non-FS or BLM	60,105	1,180	5																												
		TOTAL	60,105	1,180	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Scappoose Creek 1709001202	Salem BLM	6,436	31	0	0	0	0	0	0	2	10	0	0	3	0	3	0	0	0	0	3	2	0	3	0	0	160	0	0	0	0	1
		Non-FS or BLM	116,629	949	4																												
		TOTAL	123,064	980	4	0	0	0	0	0	2	10	0	0	3	0	3	0	0	0	0	3	2	0	3	0	0	160	0	0	0	0	1

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Watershed Baseline and Projected Activities
Five Year Estimate (FY 2003-2007) by Annual Average by 5th Field Watershed

(Adapted from Table 6 of the BA)

Baseline Data						Activity Levels																											
Subasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
L. Will. (cont.)	Columbia Slough / Willamette River 1709001203	Salem BLM	85	0	0																												
		Non-FS or BLM	77,910	1,922	10																												
		TOTAL	77,994	1,922	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Necanicum	Necanicum River 1710020101	Non-FS or BLM	87,501	692	31																												
		TOTAL	87,501	692	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nehalem	Upper Nehalem River 1710020201	Salem BLM	4,566	30	0	1	1	0	1	0	1	4	0	0	1	0	1	0	0	5	3	2	4	0	1	0	0	100	4	0	0	0	1
		Non-FS or BLM	137,936	902	58																												
		TOTAL	142,502	932	58	1	1	0	1	0	1	4	0	0	1	0	1	0	0	5	3	2	4	0	1	0	0	100	4	0	0	0	1
	Middle Nehalem River 1710020202	Non-FS or BLM	112,416	845	31																												
		TOTAL	112,416	845	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lower Nehalem River 1710020203	Salem BLM	85	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	113,660	700	18																												
		TOTAL	113,745	700	18	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Salmonberry River 1710020204	Non-FS or BLM	45,530	228	18																												
		TOTAL	45,530	228	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	North Fork Nehalem River 1710020205	Non-FS or BLM	62,155	502	5																												
		TOTAL	62,155	502	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lower Nehalem River/Cook Creek 1710020206	Salem BLM	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	70,036	390	14																												
		TOTAL	70,052	390	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wilson/Trask/Nestucca	Little Nestucca River 1710020301	Siuslaw NF	19,238	128	0	0	68	5	10	0	1	28	0	0	5	0	5	0	0	0	0	0	5	15	0	2	0	860	0	10	0	4	0
		Salem BLM	183	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	30	0	0	0	0	0
		Non-FS or BLM	19,962	125	0																												
		TOTAL	39,383	254	0	0	68	5	10	0	1	32	0	0	5	0	5	0	0	0	0	1	7	15	0	2	0	890	0	10	0	4	0
	Nestucca River 1710020302	Siuslaw NF	69,441	257	0	0	154	5	10	0	1	89	0	0	5	0	5	8	2	16	0	0	7	15	0	3	0	4,344	0	31	0	8	0
		Salem BLM	36,701	303	0	60	100	0	10	0	3	50	0	0	1	4	6	0	10	15	5	4	75	0	4	1	2	1,760	4	3	0	0	1
		Non-FS or BLM	58,508	434	0																												
		TOTAL	164,650	994	0	60	254	5	20	0	4	139	0	0	6	4	11	8	12	31	5	4	82	15	4	4	2	6,104	4	34	0	8	1
	Tillamook River 1710020303	Siuslaw NF	894	7	0	0	5	2	2	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
		Salem BLM	288	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	60	0	0	0	0	1
		Non-FS or BLM	37,708	271	1																												
		TOTAL	38,890	279	1	0	5	2	2	0	0	4	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	62	0	0	0	0	1
	Trask River 1710020304	Salem BLM	9,025	20	0	0	0	0	1	0	1	4	0	1	1	0	1	0	1	0	0	3	4	0	4	0	0	180	0	0	0	0	0
		Non-FS or BLM	102,766	606	16																												
		TOTAL	111,792	626	16	0	0	0	1	0	1	4	0	1	1	0	1	0	1	0	0	3	4	0	4	0	0	180	0	0	0	0	0
	Wilson River 1710020305	Salem BLM	3,437	5	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	2	2	0	2	0	0	60	1	0	0	0	1
		Non-FS or BLM	119,449	602	63																												
		TOTAL	122,886	607	63	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	2	2	0	2	0	0	60	1	0	0	0	1
	Kilchis River 1710020306	Salem BLM	2,937	11	0	0	0	0	0	0	1	4	0	0	0	0	1	0	0	0	0	2	2	0	1	0	0	330	0	0	0	0	1
		Non-FS or BLM	64,991	322	10																												
		TOTAL	67,928	333	10	0	0	0	0	0	1	4	0	0	0	0	1	0	0	0	0	2	2	0	1	0	0	330	0	0	0	0	1
	Miami River 1710020307	Non-FS or BLM	23,005	145	2																												
		TOTAL	23,005	145	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Watershed Baseline and Projected Activities
Five Year Estimate (FY 2003-2007) by Annual Average by 5th Field Watershed

(Adapted from Table 6 of the BA)

Baseline Data						Activity Levels																											
Subasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
W/T/N (cont.)	Spring Creek / Sand Lake / Neskowin Frontal 1710020310	Siuslaw NF	7,625	46	0	0	25	5	10	0	1	0	0	0	5	0	5	0	0	1,000	0	0	1	9	0	1	0	126	0	10	0	2	0
		Salem BLM	95	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		Non-FS or BLM	24,586	167	3																												
		TOTAL	32,307	213	3	0	25	5	10	0	1	4	0	0	5	0	5	0	0	1,000	0	0	1	9	0	1	0	126	0	10	0	2	1
	Spring Creek / Sand Lake / Neskowin Frontal 1710020311	Siuslaw NF	8,029	32	0	0	9	5	10	0	1	0	0	0	5	0	5	4	1	0	0	0	1	5	0	0	0	52	0	1	0	1	0
		Non-FS or BLM	8,288	56	0																												
		TOTAL	16,317	88	0	0	9	5	10	0	1	0	0	0	5	0	5	4	1	0	0	0	1	5	0	0	0	52	0	1	0	1	0
Siletz/Yaquina	Upper Yaquina River 1710020401	Salem BLM	418	7	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	75	0	0	0	0	0
		Non-FS or BLM	52,738	246	43																												
		TOTAL	53,156	253	43	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	75	0	0	0	0	0
	Big Elk Creek 1710020402	Siuslaw NF	16,222	77	0	0	33	5	10	0	2	15	0	0	5	5	5	0	0	0	5	0	5	0	3	0	0	400	0	1	0	0	1
		Salem BLM	2,613	21	0	2	2	1	1	0	1	0	0	1	1	4	1	0	0	0	0	1	0	0	0	0	0	280	0	0	0	0	0
		Non-FS or BLM	37,980	223	0																												
		TOTAL	56,814	321	0	2	35	6	11	0	3	15	0	1	6	9	6	0	0	0	5	1	5	0	3	0	0	680	0	1	0	0	1
	Lower Yaquina River 1710020403	Siuslaw NF	3,601	14	0	0	8	5	10	0	2	15	0	0	5	5	5	0	0	0	0	0	1	0	3	0	0	98	0	1	0	0	1
		Salem BLM	43	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	20	0	0	0	0	0
		Non-FS or BLM	46,975	223	22																												
		TOTAL	50,619	239	22	1	8	5	10	0	2	15	0	0	5	5	5	0	0	0	0	1	1	0	3	0	0	118	0	1	0	0	1
	Upper Siletz River 1710020404	Salem BLM	12,580	74	0	3	2	2	1	0	1	30	0	1	1	5	1	1	0	1	0	2	0	0	0	1	0	20	0	0	0	0	0
		Non-FS or BLM	31,881	257	4																												
		TOTAL	44,462	331	4	3	2	2	1	0	1	30	0	1	1	5	1	1	0	1	0	2	0	0	0	1	0	20	0	0	0	0	0
	Middle Siletz River 1710020405	Salem BLM	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	41,453	248	25																												
		TOTAL	41,467	248	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rock Creek / Siletz River 1710020406	Salem BLM	1,470	16	1	1	1	1	1	0	1	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	150	0	0	0	0	0
		Non-FS or BLM	26,087	129	34																												
		TOTAL	27,557	145	35	1	1	1	1	0	1	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	150	0	0	0	0	0
	Drift/Schooner 1710020409	Siuslaw NF	18,339	117	0	0	27	5	5	0	1	45	0	0	12	0	5	2	2	0	0	0	6	9	0	0	0	965	0	3	0	0	0
		Salem BLM	2,341	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	17,471	119	4																												
		TOTAL	38,151	247	4	0	27	5	5	0	1	45	0	0	12	0	5	2	2	0	0	0	6	9	0	0	0	965	0	3	0	0	0
	Salmon River / Siletz / Yaquina Bay 1710020408	Siuslaw NF	11,082	63	0	0	31	5	10	0	2	0	0	0	5	0	5	2	2	5	0	0	3	0	0	0	0	471	0	2	0	0	0
		Salem BLM	2,981	21	0	3	2	1	1	0	0	0	0	1	1	8	2	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
		Non-FS or BLM	44,248	378	2																												
		TOTAL	58,311	462	2	3	33	6	11	0	2	0	0	1	6	8	7	2	2	5	0	0	3	0	0	1	1	471	0	2	0	0	0
	Lower Siletz 1710020407	Siuslaw NF	4,415	17	0	0	8	2	2	0	1	0	0	0	5	0	5	0	0	0	0	0	1	0	0	0	0	110	0	1	0	0	0
		Salem BLM	587	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	79,130	400	16																												
		TOTAL	84,132	423	16	0	8	2	2	0	1	0	0	0	5	0	5	0	0	0	0	0	1	0	0	0	0	110	0	1	0	0	0
	Devils Lake / Moolack Frontal 1710020410	Salem BLM	64	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	30,302	267	2																												
		TOTAL	30,366	270	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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(Adapted from Table 6 of the BA)

Baseline Data						Activity Levels																											
Subasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
Alsea	Upper Alsea River 1710020501	Siuslaw NF	1,019	7	0	0	6	5	10	0	0	15	0	0	5	5	5	1	0	15	0	0	1	0	3	0	0	0	0	2	0	0	1
		Salem BLM	41,346	270	3	35	15	1	1	1	1	50	0	2	1	6	2	9	0	15	0	4	0	2	0	1	0	1,150	0	5	0	0	0
		Eugene BLM	1,662	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	37,237	378	3																												
		TOTAL	81,263	671	6	35	21	6	11	1	1	65	0	2	6	11	7	10	0	30	0	4	1	2	3	1	0	1,150	0	7	0	0	1
	Five Rivers / Lobster Creek 1710020502	Siuslaw NF	46,833	215	0	0	103	5	10	0	10	15	0	0	5	5	5	0	0	0	5	0	45	0	3	1	0	1,046	0	1	0	0	2
		Salem BLM	13,461	84	0	6	4	1	1	1	1	75	0	1	1	2	2	0	0	0	0	3	0	0	0	1	1	440	0	2	0	0	0
		Eugene BLM	1,317	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	14,743	88	0																												
		TOTAL	76,354	397	0	6	107	6	11	1	11	90	0	1	6	7	7	0	0	0	5	3	45	0	3	2	1	1,486	0	3	0	0	2
	Drift Creek 1710020503	Siuslaw NF	28,452	90	0	0	32	5	10	0	4	15	0	0	5	5	5	1	1	2	0	0	41	0	3	1	0	359	0	1	0	0	1
		Salem BLM	1,188	9	0	2	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	100	0	0	0	0	0
		Non-FS or BLM	14,656	97	0																												
		TOTAL	44,297	196	0	2	32	6	11	0	4	15	0	0	5	6	5	1	1	2	0	1	41	0	3	1	0	459	0	1	0	0	1
	Lower Alsea River 1710020504	Siuslaw NF	41,626	198	0	0	94	5	10	0	10	15	0	0	5	5	5	0	0	0	61	0	30	0	3	0	0	828	0	5	0	0	2
		Salem BLM	13,103	102	0	9	9	1	1	1	1	75	0	2	1	11	6	0	0	20	0	2	0	0	0	1	1	450	0	0	0	0	0
		Non-FS or BLM	45,008	314	0																												
		TOTAL	99,737	614	0	9	103	6	11	1	11	90	0	2	6	16	11	0	0	20	61	2	30	0	3	1	1	1,278	0	5	0	0	2
	Beaver Creek / Waldport Bay 1710020505	Siuslaw NF	10,207	46	0	0	29	5	10	0	2	15	0	0	5	5	5	0	0	100	60	0	22	0	3	1	0	297	0	4	0	0	1
		Salem BLM	349	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	21,210	139	0																												
		TOTAL	31,766	185	0	0	29	5	10	0	2	15	0	0	5	5	5	0	0	100	60	0	22	0	3	1	0	297	0	4	0	0	1
	Yachats River 1710020506	Siuslaw NF	27,237	120	0	0	43	5	10	0	5	15	0	0	5	5	5	0	0	0	3	0	22	0	3	0	0	474	0	1	0	0	1
		Salem BLM	265	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	20	0	0	0	0	0
		Non-FS or BLM	11,094	70	0																												
		TOTAL	38,595	192	0	1	44	5	10	0	5	15	0	0	5	5	5	0	0	0	3	1	22	0	3	0	0	494	0	1	0	0	1
	Cummins Creek / Tenmile Creek / Mercer Lake Frontal 1710020507	Siuslaw NF	53,615	172	15	0	62	5	10	0	7	20	0	0	5	5	5	15	7	55	200	0	36	0	3	2	0	619	0	7	0	0	1
		Eugene BLM	322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	15,110	89	0																												
		TOTAL	69,046	261	15	0	62	5	10	0	7	20	0	0	5	5	5	15	7	55	200	0	36	0	3	2	0	619	0	7	0	0	1
Siuslaw	Upper Siuslaw River 1710020601	Eugene BLM	56,283	367	0	169	54	6	4	7	11	40	40	0	6	5	3	1	0	0	69	8	48	34	17	4	2	3,032		10	0	1	1
		Non-FS or BLM	71,683	575	0																												
		TOTAL	127,966	942	0	169	54	6	4	7	11	40	40	0	6	5	3	1	0	0	69	8	48	34	17	4	2	3,032	0	10	0	1	1
	Wolf Creek 1710020602	Eugene BLM	16,695	89	0	43	13	5	4	0	7	20	25	0	4	5	3	0	0	0	0	5	30	24	9	4	2	928	1	2	0	0	0
		Non-FS or BLM	21,199	213	0																												
		TOTAL	37,895	302	0	43	13	5	4	0	7	20	25	0	4	5	3	0	0	0	0	5	30	24	9	4	2	928	1	2	0	0	0
	Wildcat Creek 1710020603	Eugene BLM	14,072	60	0	4	9	2	2	0	2	10	20	0	1	1	1	0	0	0	0	1	8	0	0	0	0	200	3	1	0	1	1
		Non-FS or BLM	20,781	143	0																												
		TOTAL	34,853	203	0	4	9	2	2	0	2	10	20	0	1	1	1	0	0	0	0	1	8	0	0	0	0	200	3	1	0	1	1
	Lake Creek 1710020604	Siuslaw NF	4,516	17	0	0	9	5	10	0	2	5	0	0	1	5	5	0	0	0	0	0	10	0	3	0	0	53	0	1	0	0	0
		Eugene BLM	29,801	215	2	124	30	2	2	0	5	20	30	0	5	3	3	0	0	20	0	3	19	0	0	1	1	750	0	1	0	1	1
		Non-FS or BLM	40,108	223	3																												
		TOTAL	74,425	455	5	124	39	7	12	0	7	25	30	0	6	8	8	0	0	20	0	3	29	0	3	1	1	803	0	2	0	1	1

Vertically barred rows indicate that ESA coverage is not being requested for that watershed. Hash-marked rows indicate that listed fish are not present in that watershed.

Watershed Baseline and Projected Activities
Five Year Estimate (FY 2003-2007) by Annual Average by 5th Field Watershed

(Adapted from Table 6 of the BA)

Subbasin	5ths	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
						Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
						NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
Siuslaw (cont.)	Deadwood Creek 1710020605	Siuslaw NF	24,652	89	0	0	41	5	10	0	10	16	0	0	10	5	5	0	0	0	0	0	27	0	3	1	0	363	0	1	0	0	2
		Eugene BLM	5,753	14	0	2	1	1	1	0	3	0	5	0	1	1	1	0	0	0	0	1	5	0	0	0	1	100	0	1	0	1	1
		Non-FS or BLM	7,179	41	0																												
		TOTAL	37,585	144	0	2	42	6	11	0	13	16	5	0	11	6	6	0	0	0	0	1	32	0	3	1	1	463	0	2	0	1	3
	Indian Creek/Lake Creek 1710020606	Siuslaw NF	25,405	97	2	0	40	5	10	0	7	16	0	0	10	5	5	0	0	0	5	0	30	0	3	1	0	444	0	1	0	0	1
		Non-FS or BLM	5,377	23	0																												
		TOTAL	30,782	120	2	0	40	5	10	0	7	16	0	0	10	5	5	0	0	0	5	0	30	0	3	1	0	444	0	1	0	0	1
	North Fork Siuslaw River 1710020607	Siuslaw NF	31,820	123	2	0	54	5	10	0	7	16	0	0	10	5	5	1	0	5	15	0	37	0	3	1	0	419	0	1	0	0	0
		Eugene BLM	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non-FS or BLM	10,305	45	1																												
		TOTAL	42,200	168	3	0	54	5	10	0	7	16	0	0	10	5	5	1	0	5	15	0	37	0	3	1	0	419	0	1	0	0	0
	Lower Siuslaw River 1710020608	Siuslaw NF	43,384	127	3	0	68	5	10	0	4	12	0	0	10	5	5	0	2	10	2	0	28	0	3	1	1	153	0	1	0	0	1
		Eugene BLM	5,485	22	0	18	6	1	1	0	5	10	20	0	2	2	2	1	0	0	24	2	6	0	0	0	0	200	0	1	0	1	1
		Non-FS or BLM	61,632	310	1																												
		TOTAL	110,501	459	4	18	74	6	11	0	9	22	20	0	12	7	7	1	2	10	26	2	34	0	3	1	1	353	0	2	0	1	2
Siltcoos	Waohink River / Siltcoos River / Tahkenitch Lake Frontal 1710020701	Siuslaw NF	33,176	100	12	0	44	5	10	0	9	40	0	0	10	5	5	4	0	125	0	0	25	0	7	0	0	60	0	3		0	1
		Coos Bay BLM	1,152	4	0																												
		Non-FS or BLM	49,126	199	6																												
		TOTAL	83,454	303	18	0	44	5	10	0	9	40	0	0	10	5	5	4	0	125	0	0	25	0	7	0	0	60	0	3	0	0	1

SUMMARY — Annual Total

	Owner	Extent (Acres)	Roads (Miles)	Trails (Miles)	Road Maintenance and Storm Proofing		Road Decom-missioning and Obliteration		Aquatic and Riparian Habitat Projects								Recreation Site, Trail, and Admin Structure Maintenance				Fish, Wildflife, Botany and Cultural Resource Programs		Pump Chance / Helipond Maintenance or Use		Rock Quarry Operations		Non- Commercial Vegetation Treatment		Misc. Special Use Permits and Leases		Telephone Line, Power Line Renewal, Special Use Permits, ROW Renewals	
					Road Miles		Road Miles		Stream Miles		Rip. Acres		Fish Culverts		100yr Culv.		Trail Miles		Site Acres		Stream Miles		Quantity		Quantity		Acres		Quantity		Quantity	
					NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA	NLAA	LAA
All Watersheds	Coos Bay BLM	1,152	4	0																												
	Eugene BLM	308,818	1,956	6	773	272	57	52	23	67	235	275	28	54	106	95	107	6	188	317	101	202	118	61	27	22	9,066	54	44	0	17	17
	Mt. Hood NF	855,271	3,062	289	994	453	140	82	18	48	201	253	35	30	33	38	497	388	46	245	54	259	30	44	25	23	3,606	247	365	0	14	17
	Prineville BLM	3,238	0	0																												
	Salem BLM	397,145	2,545	15	485	263	31	25	4	27	525	0	17	20	98	48	37	17	479	21	84	98	14	27	26	7	8,305	22	17	0	1	15
	CRGN Scenic Area	42,153	47	61	19	6	3	1	2	5	40	45	0	4	1	4	47	8	10	14	50	16	12	20	1	0	55	15	53	0	0	0
	Siuslaw NF	547,643	2,266	34	0	995	109	209	0	88	407	0	0	139	75	111	38	17	1,333	356	0	384	53	49	15	1	12,541	0	89	0	15	16
	Umpqua NF	87,577	368	39																												
	Willamette NF	1,647,543	5,127	1,108	648	43	123	88	27	20	490	33	0	45	126	28	933	11	1,099	89	249	207	519	45	83	6	13,558	230	455	124	31	8
	FS/BLM Subtotal	3,890,540	15,375	1,552	2,919	2,031	463	457	73	254	1,898	606	80	292	439	324	1,659	447	3,155	1,042	538	1,166	746	246	177	59	47,131	568	1,023	124	78	73
	Non-FS or BLM	7,828,594	53,520	1,092																												
	TOTAL	11,719,134	68,894	2,644																												

Vertically barred rows indicate that ESA coverage is not being requested for that watershed. Hash-marked rows indicate that listed fish are not present in that watershed.

APPENDIX B
Federal Analysis of Effects and Determination form

Federal Analysis of Effects and Determination

Complete one form for each project or ongoing activity - multiple units can go on one form

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I have reviewed the following project and have determined that it is consistent with the Northwest Oregon Programmatic BO and that an individual project level BA is not required. ***(If the Effect Determination exceeds the typical range of effects allowed under this BA for given activity type in the Programmatic BA/BO, then a separate consultation is required.)***

Name/Title of Project:

Programmatic Category (see Table 5 Program, Description and Project Design Criteria):

NEPA Document Type (EA, Categorical Exclusion) and Number:

Fiscal Year Project will be Implemented:

Project Lead:

Project Location and Size (identify all Watersheds/Subwatersheds affected and the units in each):

4th-Field Watershed	5th-Field Watershed	Subwatershed	Acres	Sites

Project Effect Determination (circle): LAA NLAA NE

List rationale for Effects Determination:

Are the project's effects on the Checklist Indicators the same as indicated in the Programmatic BA?
Yes No If No, indicate how and why the effects are different.

Is the project consistent with the Project Design Criteria for the appropriate category of the Programmatic BA/BO? Yes No
Is the project consistent with the Terms and Conditions in the Incidental Take Statement of the BO?
Yes No (If No to either question, the project cannot be covered by the Programmatic BA/BO).

Briefly Describe Project:

If appropriate, list interrelated and interdependent effects here:

Fisheries Biologist Name: Date:

Make 2 duplicates - the original goes with project or NEPA file; the first duplicate is maintained in the Area or District Biologist's files, the second duplicate goes to the Level 1 team representative.