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

October 29, 2001

Colonel Ralph H. Graves
District Engineer
U.S. Army Corps of Engineers
Seattle District
Post Office Box 3755
Seattle, Washington 98124-3755

Attention: Tom Mueller

Re: Biological Opinion on Corps of Engineers' Programmatic Consultation for Permit Issuance for 4 Categories of Fish Passage Restoration Activities in Washington (NMFS No. WSB-01-197)

Dear Colonel Graves:

Enclosed is the National Marine Fisheries Service's (NMFS) biological opinion (Opinion) concluding formal Endangered Species Act consultation on issuance of permits for 4 categories of fish passage restoration activities in Washington as described in the U.S. Army Corps of Engineer's biological assessment (BA) dated April 13, 2001. This Opinion addresses Snake River sockeye salmon (*Oncorhynchus nerka*); Ozette Lake sockeye salmon (*O. nerka*); Snake River spring/summer chinook salmon (*O. tshawytscha*); Snake River fall chinook salmon (*O. tshawytscha*); Puget Sound chinook salmon (*O. tshawytscha*); Lower Columbia River steelhead (*O. mykiss*); Upper Columbia River steelhead (*O. mykiss*); Snake River steelhead (*O. mykiss*); Upper Willamette River steelhead (*O. mykiss*); Middle Columbia River steelhead (*O. mykiss*); Columbia River chum salmon (*O. keta*); Hood Canal Summer-run chum salmon (*O. keta*); Lower Columbia River chinook salmon (*O. tshawytscha*); Upper Willamette River chinook salmon (*O. tshawytscha*); Upper Columbia River Spring-run chinook salmon (*O. tshawytscha*). Lower Columbia River/Southwest Washington coho salmon (*O. kisutch*), a candidate species, has also been considered in this opinion.

The NMFS has determined that the proposed action is not likely to jeopardize the continued existence of the listed species described above or adversely modify designated critical habitat. An Incidental Take Statement provides non-discretionary terms and conditions to minimize the potential for incidental take of listed species.

In addition, this document also serves as consultation on Essential Fish Habitat for coho and chinook salmon under the Magnuson-Stevens Act and its implementing regulations (50 CFR Part 600).

We appreciate the considerable effort and cooperation provided by your staff in completing this consultation. If you have any questions regarding this Opinion, please contact Dan Guy at (360) 534-9342 of my staff in the Washington State Branch Office.

Sincerely,

Michael R Crouse

D. Robert Lohn
Regional Administrator

Endangered Species Act Section 7 Consultation
and
Magnuson-Stevens Act
Essential Fish Habitat Consultation

Programmatic Biological Opinion

Phase II Fish Passage Restoration
Department of the Army Permits
(WSB-01-197)

Agency: Army Corps of Engineers, Seattle District

Consultation Conducted By: National Marine Fisheries Service,
Northwest Region
Washington State Habitat Branch

Approved Michael R Course
D. Robert Lohn
Regional Administrator

Date Issued: October 29, 2001

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I. BACKGROUND AND DESCRIPTION OF PROPOSED PROJECT

A. Background

On April 16, 2001, the National Marine Fisheries Service (NMFS) received a request from the U.S. Army Corps of Engineers, Seattle District (COE) for formal consultation pursuant to Section 7 of the Endangered Species Act (ESA) for programmatic coverage of activities requiring COE permits intended to remove certain fish passage barriers. The biological assessment (BA) received with the request is phase II of an ongoing consultation effort between NMFS and the COE. Phase I programmatic was for a suite of projects, minor in scope, that was consulted on informally. NMFS concurred with the effects determination of "may effect, not likely to adversely affect" for NMFS' ESA species. Phase II begins a series of chapters that will programmatically review habitat restoration/rehabilitation activities.

The BA described the COE's determination that some of the proposed activities would be "likely to adversely affect" anadromous fish species listed under the ESA. Species considered in this biological opinion (Opinion) are: Snake River sockeye salmon (*Oncorhynchus nerka*); Ozette Lake sockeye salmon (*O. nerka*); Snake River spring/summer chinook salmon (*O. tshawytscha*); Snake River fall chinook salmon (*O. tshawytscha*); Puget Sound chinook salmon (*O. tshawytscha*); Lower Columbia River steelhead (*O. mykiss*); Upper Columbia River steelhead (*O. mykiss*); Snake River steelhead (*O. mykiss*); Upper Willamette River steelhead (*O. mykiss*); Middle Columbia River steelhead (*O. mykiss*); Columbia River chum salmon (*O. keta*); Hood Canal Summer-run chum salmon (*O. keta*); Lower Columbia River chinook salmon (*O. tshawytscha*); Upper Willamette River chinook salmon (*O. tshawytscha*); Upper Columbia River Spring-run chinook salmon (*O. tshawytscha*). Lower Columbia River/Southwest Washington coho salmon *(O. kisutch)*, a candidate species, has also been considered in this Opinion.

The objective of this Opinion is to determine programmatically whether the adoption of proposed conditions for phase II, fish passage restoration activities permitted by the COE throughout the State of Washington will jeopardize listed species or destroy or adversely modify the designated critical habitat of listed species. The COE initiated formal consultation seeking to ensure that their program issuing permits for those activities without further ESA consultation and the adoption of proposed standard operating procedures will not jeopardize the continued existence of listed salmonids, or destroy, or adversely modify designated critical habitat. This Opinion also documents consultation under the Magnuson-Stevens Act of 1996.[1] This Opinion was developed pursuant to the Endangered Species Act. It is not intended to, nor does it limit, abridge, abrogate, or otherwise adversely affect any Indian right reserved by treaty, executive

[1]Public Law 104-267, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act to establish new requirements for "Essential Fish Habitat" (EFH) descriptions in Federal fishery management plans (FMPs) and to require that Federal agencies consult with NMFS on activities that may adversely affect EFH. Under section 305(b)(4) of the Act, NMFS is required to provide discretionary EFH conservation and enhancement recommendations to Federal and state agencies for actions that may adversely affect EFH. However, state agencies and private parties are not required to consult with NMFS unless that action requires a Federal permit or receive Federal funding.

order, or statute.

B. Proposed Action

Section 404 of the Clean Water Act requires an individual to acquire authorization from the COE for the discharge of dredged or fill materials into all waters of the United States, including wetlands. Section 10 of the Rivers and Harbors Act requires an individual to acquire authorization from the COE for the construction of any structure in or over any navigable water of the United States. The COE reviews requests from individuals and may issue a permit allowing these fish passage restoration/rehabilitation activities to be conducted.

The proposed action involves the adoption of certain specifications for fish passage restoration projects that are to be conducted. Construction conducted according to these permit conditions would cover four categories of fish passage restoration activities within the State of Washington including removal of fish passage barriers at stream crossings, tide gates, debris jams, and sediment bars. These activities are further defined by the mandatory conservation measures proposed by the COE and by terms and conditions that will result from this consultation. Additionally, this consultation includes the development of monitoring, review and reporting standards for these activities. Since in most cases NMFS will not individually review project documentation the proposed action defines how projects will be documented and presented to NMFS at periodic reviews. For individual projects not incorporating all of the applicable[2] conservation measures, the programmatic framework also defines a tiered consultation process that the COE and the Services will follow. Under the tiered consultation framework, the COE will submit individual projects to NMFS for review. The project will come to NMFS as an individual programmatic biological assessment (IPBA) or an abbreviated biological assessment (BA) that tiers from this programmatic consultation. The applicable information forms, Supplemental Information Form and ESA Programmatic Notification to the Services, as well as an applicable excerpt from the Programmatic Biological Assessment are included in Appendix A.

1. Removal of Fish Passage Barriers at Stream Crossings by Roads, Levees, and Dikes

The objective of passage barrier removal is to allow anadromous salmonids access to historical habitats from which they have been excluded by non-functioning road crossing structures, predominately culverts. Barrier removal could involve removal of the culvert, replacement with

[2]The programmatic BA lists 25 individual conservation measures some with sub-components. Conservation measures that do not apply to a particular project are not "applicable." For example a project that does not include the re-fueling of heavy equipment does not need to include the provision for re-fueling 150 feet from a stream; it is not applicable. All other conservation measures that are applicable to a project will be part of the project design if it is to fall under this programmatic consultation. The "tiered" review also allows for some modification.

appropriately sized culvert or another road crossing structure such as a bridge, bottomless culvert, or arch pipe. Excavation of the road bed or levee to access and remove a blocking culvert is a common practice. Equipment to excavate and remove the fill material would typically include a backhoe or shovel and dump trucks to haul or place the fill. Removing fill and exposing raw slopes has the potential to create or worsen an existing fine sediment source. Heavy equipment in the work area also poses the risk of petro-contamination from a fuel spill.

Excavation in the streambed to place weirs or streambed controls may also be expected. In certain circumstances streambed grading in conjunction with bed controls to create a passable stream channel and to prevent further head-cutting may be proposed. Placing streambed substrate in the crossing structure and placement of large woody debris (LWD) may also be associated with the project. Minimal bank protection of the roadway fill prism with rip rap at the inlet and outlet of a new culvert may also be required for project security.

Riparian degradation occurs when trees are removed to access the site or provide working space for on-site equipment. Impacts to riparian function may occur when new road construction is required to access a site. Exposed soils in the riparian zone and adjacent upland construction zone also occur and require treatment upon project completion.

2. Restore or Improve Fish Passage at Tide Gates

Tide gates have typically been installed on culverts passing through levees, dikes, and berms to prevent tidal inundation in areas landward of the berms. It is because of the loss of important estuarine rearing habitat opportunities that this project category is supported. Tide gates have also been used in applications to prevent flooding during high flow events. Tide gates are frequently mounted on the outlet end of a culvert. As the tide backs up and closes the tide gate fish passage upstream is blocked. As the tide turns and begins to flow out, a typical tide gate opens a little but often not enough to allow upstream passage and/or with such velocity as to constitute a passage blockage or partial blockage. Fish passage can be restored through removal of the tide gate or modification to more passable designs. Self-regulating tide gates, a mechanical design where the opening and closing of the gate is controlled by a float system, can restore fish passage and tidal flushing to upstream areas while still maintaining flood control functions.

Tide gate removal has few impacts, requiring only removing some fasteners and lifting the gate out of the stream channel. Depending on the size of the structure boat transportation as a work platform may be utilized or heavy equipment working from the dike or levee may be utilized. Likewise, installing only an improved design tide gate would likely have minimal construction impacts. In instances where the culvert also needs work the level of impacts might be similar to the effects of excavation to remove old culverts. Using heavy equipment along the shoreline to remove fill would commonly occur. In some cases, work might occur from a floating work platform. Sediment control activities would be required and some level of erosion protection at the inverts would reduce the risk of sediment inputs over background levels.

3. Removal of Certain Debris Jams that Block Fish Passage

Large woody debris (LWD) has an essential role in forming and maintaining instream fish habitat. Other forms of debris, such as human made waste can accumulate in streams in locations and configurations that block fish passage. Fish passage can be restored by removing debris jams formed from human generated garbage.

Removal of these blockages typically requires access for excavation and hauling equipment, excavation/removal of the debris jam, and restoration of the streambed and riparian area. Excavation might typically be done with a small trackhoe or backhoe and material removed with a dump truck. Removal from remote sites without nearby road access could be accomplished with a logging tower and bucket that would minimize impacts to the aquatic system. If the activity requires road access then all the impacts associated with road construction; riparian impacts, sediment inputs and the potential for contaminants become part of the effects analysis. The COE might also need to permit the restoration of the streambed gradient to allow fish passage.

4. Removal or Modification of Sediment Bars or Terraces That Block Fish Passage; Placement of Sandbags to Facilitate Fish Passage

Land uses practices such as agriculture and urban development have contributed increased sediment in streams. In some instances this sediment can accumulate at the stream mouth, forming a bar or terrace. The bar or terrace can spread the streamflow into finely braided or sheet flow patterns, forming temporal or complete passage barriers to fish.

Fish passage can be restored or rehabilitated by removal of the bar at the mouth of a stream. In most instances, the sediment bar or terrace is a symptom of poor upland land use practices and bar removal is a short-term solution. To permanently restore fish passage changes in land use practices are necessary. The benefits from restoring or rehabilitating fish passage, even temporarily, "*likely* outweigh the adverse impacts resulting from such action" (emphasis added). No action under the programmatic will remove more than 25 cubic yards from within 25 feet of the mouth of the stream. Streambed grading could occur within 50 feet of the mouth of a stream. Construction of access roads for equipment access and their associated impacts are addressed in the best management practices (BMP) section, described later in this document.

Passage issues caused by low flows over control points (gravel bars) can also be addressed by constricting flow with sandbags to create passable stream conditions. The installation of sandbags in selected watercourses in a manner to effect sufficient water depth and flow characteristics will allow for the migration of fishes of concern. Sandbags will be used in some instances to concentrate flow at shallow, impassible riffles to form a deeper, focused thalweg. They may also be used to direct flow to isolated refuge habitats of fishes of concern, such as disconnected pools, or to create dammed step pools to allow fishes of concern to ascend transient migration barriers. For the purposes of this action, fishes of concern are resident and anadromous salmonids.

General Practices: Construction related impacts from these projects is dependant on the size and scope of the project and the equipment used. Equipment used to accomplish the tasks might range from shovels and rakes to trackhoes and bulldozers. Pile driving equipment and dynamite are potential methods associated with these restoration activities. (NOTE: The programmatic consultation does not cover any proposed project that includes the use of explosives as a requisite component of in-water work details.) Limiting the removal of stream bed materials to 25 cubic yards suggests that in some circumstances the use of hand labor to avoid road construction impacts may be the right decision. Work methods also include isolating the work from flowing waters to allow work to take place in the dry. Placement of sandbags requires only the delivery of materials and placement of the bags on the streambed. Flow constrictions will be removed immediately upon return of ambient flows or when the facilitation of fish passage is not required.

Site preparation work includes fish exclusion and capture protocol as described later in the conservation BMP section of this Opinion. Replacement of existing culverts with like structures are to be sized appropriately as per Washington Department of Fish and Wildlife (WDFW) criteria. The BA also describes project components like streambed controls and weirs where needed. Streambed controls may be constructed of rock, wood, or concrete across the stream channel to prevent scouring or headcutting in the vicinity of the stream crossing. Weirs may be required in unusual circumstances to achieve fish passage design on steep streams (gradients up to 12%) or existing culverts that have substantial elevation drop at the inlet of outlet.

When concrete weirs or fish ladders are used in such unusual situations construction may consist of pre-cast or cast-in-place construction requiring excavation for footings, placement of forms and concrete pours. No uncured concrete would come in contact with surface waters. The programmatic BA acknowledges a prioritization of solutions to passage blocking culverts. The preferred option is culvert removal followed by replacement with a bridge or arch culvert, bottomless culvert and lastly replacement with a countersunk round pipe or box culvert.

How the four types of fish passage restoration projects will be accomplished are defined by the 25 conservation measures or BMPs. These conservation measures, as they apply, will be required elements of each proposed project. The BMPs control the way work is accomplished at the project site and serve to minimize the impacts of the work on listed species and their habitat. Because these conservation measures will be required elements of the project as dictated by any approved COE permit they help inform the overall effects of the projects. "As they apply" recognizes that the full suite of 25 conservation measures and all of the sub-parts may not always apply, see footnote 2. Conversely, any conservation measure BMP that does apply to a project shall be followed as stated. If a COE project manager agrees to wave a BMP the tiered consultation, as described, with the Services will first be completed. The tiered consultation dictates that a project not complying with all the applicable conservation measures will be reviewed by NMFS for concurrence before approval by the COE. NMFS may also withhold concurrence and require the project undergo individual section 7 consultation.

The 25 **conservation measures** are as follows:

a. Supplemental documentation. In addition to standard permit application requirements[3], project proponents must submit the following supplemental documentation:

   i. Locations of equipment ingress/egress points [may be shown on project plans, see Conservation Measure (m)(iv)] and
   ii. Description of the project bypass method [including drawings, see Conservation Measure (n)].

   Other supplemental documentation may be required by Conservation Measures (c) [discussion of potential alternatives], (k) [modification of timing windows], (o)(ii)(c) [electroshocking], and (v) [a planting plan for projects that remove or degrade riparian vegetation].

b. Standard Fish Passage Design. Projects will be designed to meet either WDFW's fish passage criteria for salmon and trout (WDFW 1999) or other criteria that are specified by the Services.

c. Minimized Habitat Effects (Stream and riparian). Projects designed to remove fish passage barriers will avoid and minimize long- and short-term impacts to stream and riparian habitat. For stream crossings, complete removal of the culvert or blockage will be implemented wherever feasible. For replacement or retrofit culverts or tide gates, removal and abandonment of the crossing/tide gate, a full-spanning bridge, or a full-spanning arch or bottomless culvert are presumed to be practicable alternatives unless clearly demonstrated otherwise. In addition, bridges and full-spanning arch or bottomless culverts are presumed to have less adverse impact on the aquatic environment, unless clearly demonstrated otherwise.

   Accordingly, for replacement or retrofit culverts or tide gates (see exception below), applicant must provide a written analysis of the practicability of crossing removal and abandonment, bridge, and full-spanning arch or bottomless culvert that will be based on the following factors:

   i. The fish and wildlife habitat functions that would be lost and/or restored;
   ii. The predicted cost associated with construction, maintenance, and repair (over the forecast life of the project);
   iii. The risk or probability of future crossing failure or loss of fish passage due to reasonable foreseeable trends in watershed development and extreme flow events; and

[3]Permit application requirements include the name, address, and telephone number of the project proponent; the location of the proposed work; and a brief description of the proposed project and its purpose. When completed, the Joint Aquatic Resources Permit Application (JARPA) form contains the standard information. For this programmatic consultation, the applicant must complete and submit the Supplemental Information for ESA Programmatic Consultation.

iv. The potential contribution to maintenance or achievement of properly functioning habitat conditions for salmonids in the watershed.

EXCEPTION: The prescribed alternatives analysis is not required for bridges, arch culverts, or bottomless culverts with footings located at least 1.2-times the average channel bed width. The channel bed width shall be determined from measurements of the stream corridor up- and downstream of the crossing location but outside of the influence of the existing crossing structure. In cases where the channel bed width is poorly defined or indeterminate, the footings must be located at least 1.2-times the width corresponding to the 2-year recurrence interval flood (WDFW, 1999).

d. LWD, boulders, and spawning gravel required for habitat restoration may be salvaged from construction or access areas but otherwise will not be taken from streams, wetlands or other sensitive areas. With the exception of salvage from construction or access areas, LWD shall not be obtained from standing or fallen trees within 250 feet landward of the edge of any stream or wetland.

e. Materials used for habitat restoration activities will be natural origin (e.g. coir wraps, coir logs, natural anchors, etc.) if they are to be retained in the landscape following completion of construction. Culverts, bridges, their footings, and materials necessary for their structural support may be man-made.

f. Excavated material will either be salvaged or disposed of and stabilized properly in *approved* (*clarification added*) upland areas where the potential for future environmental problems is minimized.

g. Public safety issues such as downstream bridge or culvert crossings that could reasonably be assumed to be endangered by stream-borne logs may necessitate anchoring of placed LWD. Where unavoidable, anchoring will be accomplished either by placing large boulders on top of the log, burying one end of the log in the bank (sometimes in conjunction with boulder placement), or cabling the log to an anchor (such as a boulder, buried ecology block, screw anchor, or driven anchor bar). Excavation (e.g. ecology block burial) within the ordinary high water mark of the stream or in vegetated areas shall occur before streamflow is re-introduced into the work area and during the approved work window [see Conservation Measure (k)].

h. All material used to restore the streambed inside a replacement culvert or under a bridge shall have enough fine materials to seal the bed (via natural processes or the particle size distribution of the material used to restore the streambed). The maximum particle size of the replacement streambed is determined by the hydraulic analysis and the fish passage flow at the proposed structure. The recommended particle size distribution of replacement streambeds is described in the following table (WDFW, 1999):

Maximum Particle Size (D100)	Particle Size Distribution			
9 in.		40%<2 in.	30%<2-5 in.	30%<5-9 in.
12 in.		40%<3 in.	30%<3-7 in.	30%<7-12 in.
18 in.	15%<1 in.	25%1-5 in.	30% 5-11 in.	30% 11-18 in.
24 in.	10%<1 in.	30% 1-6 in.	30% 6-14 in.	30% 14-24 in.
30 in.	10%<1 in.	30% 1-8 in.	30% 8-18 in.	30% 18-30 in.

i. Vegetative or integrated streambank protection methods (e.g. herbaceous ground cover, rooted stock, live stakes and slips, fascines, brush mattresses, brush layers, joint plantings, vegetated geogrids, live cribwalls, tree revetments) will be installed along with the installation of large woody debris and boulders to provide fish habitat and hydraulic diversity in the project reach.

j. Bank stabilization (at crossing structures-clarification added) using rock, concrete, bulkheads, wingwalls, or similar structures shall be limited to the existing road fill prism.

   EXCEPTION: Rock streambank stabilization may be used to key streambed controls into the streambank. No more than 3 cubic yards of rock may be used for each streambed control.

k. Timing: Construction shall occur only during the approved work window. (see Appendix C [from programmatic BA] for approved work windows.)

   EXCEPTION: Timing windows may be adjusted based on project-specific criteria approved by the Corps and Services via the tiered consultation procedures. For example, placement of large woody debris or boulders into channels may be more effective and safer during winter when leaf cover is less and overhead visibility is greater.

l. All necessary local, State, and Federal authorization will be secured prior to project implementation and copies kept at the project site; these include but are not limited to: State Hydraulic Permit Approval, local clearing and grading permit, U.S. Army Corps of Engineers permits and associated ESA documentation, State Environmental Protection Act checklist, and Shorelines permits. Construction activities shall adhere to the strictest conditions set-forth in these permits, with particular deference to requirements of the Endangered Species Act.

m. Heavy Equipment Standards and Requirements: Wherever heavy equipment or power equipment is used, the following measures should be taken to minimize effects on the landscape, associated habitat and species in the area.

i. The contractor will be required to have a Spill Prevention Control and containment Plan (SPCCP). The SPCCP will take measures to reduce the impacts from potential spills (fuel, hydraulic fluid, etc). These measures will be in place prior to the start of any construction action.
ii. Equipment staging or refueling areas must be located at least 150 feet from the edge of wetlands and streams, in areas where environmental effects from accidental spills or leakage will be minimized. Equipment will be inspected daily for leaks or accumulations of oil or grease and any identified problems will be fixed before entering areas that drain directly (without any stormwater treatment) to streams or wetlands.
iii. Existing paths and roadways will be used for access to project sites, where feasible. If existing paths and roadways cannot be used (for example, due to long distance from the work area) or do not exist, no more than 2 temporary roads to allow mechanized equipment to access the project area may be installed. Upon project completion, temporary roads will be graded and all resulting unvegetated, compacted road surfaces will be tilled and planted to promote vegetation re-establishment.
iv. Equipment ingress/egress points shall be as indicated on the project plans. Access points shall be designed to minimize impacts and, in most cases, equipments should be stationed on top of the streambank; rather than in the stream, during excavation or placement of materials in the stream.
v. Steam crossings by heavy equipment shall be avoided or minimized to the maximum practicable extent. If stream crossings are unavoidable, they shall be located as indicated on the project plans and positioned to avoid potential salmonid spawning areas and to minimize compaction of the stream bed. Where possible , the equipment operator will use temporary pads such as boulders, logs or pads to cross the stream at right angles to the main channel.

n. Bypass requirements: The work area shall be isolated from stream flow by temporarily diverting the flow from the work area or bypassing the work area altogether. Flow will be diverted using structures such as cofferdams or aqua barriers. Where fish are present, they must be removed prior to the start of construction [see Conservation Measure (o)] and actions must be taken to minimize effects on fish adjacent to the work area. Temporary bypasses must be sized large enough to accommodate the predicted peak flow rate during construction. Dissipation of flow at the outfall of the bypass system (e.g. splash protection, sediment traps) is required to diffuse the erosive energy of the flow. Water quality below the bypass outfall shall be in compliance with established standards [Conservation Measure (s)(viii) erosion and sediment control protocols] to minimize effects on habitat and associated fish downstream of the bypass. Water removed from the de-watered work area shall be pumped to upland areas and treated as necessary to ensure that it is in compliance with established standards [Conservation Measure (s)(viii)] upon re-entering any wetland, stream, or any other waterbody. To ensure that the work area is never exposed to flowing water (i.e. due to unexpected rain during the work period), bypass requirements apply to seasonally dry streams as well as streams with perennial flow.

The following are general approaches available for temporary stream bypass systems:

- Leave the steam in its existing channel until the new culvert or channel are completed, then move the stream into the new channel and abandon the old. To allow the new channel and associated vegetation to stabilize and mature, flow shall not be introduced into new channel alignments for at least one year after the completion of construction. Channel relocation shall be limited to that necessary to restore fish passage at the existing passage barrier.

- Use piping to convey stream flow around the project area. In some instances, an existing culvert can be used as the bypass, with construction proceeding next to or around the old culvert.

- Construct a temporary channel to carry stream flow during construction.

- Pump stream water to downstream of the fish exclusion reach. Bypass pumping shall occur only in the stream reach isolated by upstream and downstream block nets, but not from within the work area.

- Combine approaches to create a practical bypass system; for example, pump the stream flow downstream during work hours and pipe it through the work area during off-hours.

The bypass method shall be specified in the project description that will be reviewed by the Corps and the Services as specified in the tiered consultation process.

o. Fish Removal Procedures and Standards: Fish shall be removed from the work area according to the following methods (developed from RRMTWG, 2000; see exception below):

i. Isolate the Area: Install block nets at up and downstream locations to isolate the entire affected stream reach. This is done to prevent fish and other aquatic wildlife from moving into the work area. Block net mesh size, length, type of material, and depth will vary based on site conditions. Generally, block net mesh size is the same as the seine material(9.5 millimeters stretched). During fish removal activities, the block nets shall be left in place and checked at least once daily to make sure the nets are functioning properly. Block nets require leaf and debris removal to ensure proper function. A designated individual must monitor and maintain the nets. Block nets are installed securely along both banks and in channel to prevent failure during unforeseen rain events or debris accumulation. Some locations may require additional block net support such as galvanized hardware cloth or additional stakes or metal fence posts. The block nets shall be left in place throughout the fish removal activity and not removed until flow has been bypassed around the work area [see Conservation Measure (n)].

ii Fish Removal from the Isolated Area: The following methods provide alternatives for removal of fish from the area between the block nets. The methods are given in order of

preference. Drag netting or seining through the isolated stream reach shall be the default technique. The remaining methods shall be used only if seining is not possible. Electroshocking requires approval based on a project-specific plan approved by the Corps and Services via the tiered consultation procedures (see exception below).

1. Lengths of 9.5 mm stretched nylon mesh minnow seines are used throughout the isolated stream reach. The seine is approximately three feet wide and of various lengths with approximately fifteen feet of rope attached to either end. Sets of the seine are conducted with one person on shore and one to two people working the other end of the net through the isolated stream reach area. Once the net is out and the lead line dropped to the bottom, the other end of the 15 foot line is brought to shore and both ends of the net are pulled in quickly in tandem.

2. Collecting aquatic life by hand or with dip nets as the site is slowly de-watered.

3. Electrofishing in stream channels shall be done only where other means of fish exclusion are not feasible and where specifically approved by the Corps and Services as part of a project-specific plan (see exception below). Protocol for electrofishing is summarized below:

    a. No electrofishing in anadromous waters from October 15th to May 15th. No electrofishing in resident waters from November 1st to May 15th. Electrofishing shall not contact spawning adult salmonids or active redds.

    b. Equipment must be in good working condition and operators shall go through the manufacturer's preseason checks, adhere to all provisions, and record major maintenance work in a logbook.

    c. Measure conductivity and set voltage as follows:

Conductivity (umhos/cm)	**Voltage**
Less than 100	900 to 1100
100-300	500-800
Greater than 300	to 400

    d. Only Direct Current (DC) or Pulsed Direct Current (PDC) shall be used.

    e. Each session shall begin with pulse width and rate set to the minimum needed to capture fish. These settings should be gradually increased only to the point where fish are immobilized and captured. Start with pulse width of 500 µseconds and do not exceed 5 milliseconds. Pulse rate should start at 30 Hertz (Hz) and work carefully upwards. In general, exceeding 40 Hz will injure more fish.

f. Do not allow fish to come in contact with the anode. The zone of potential fish injury is 0.5 m from the anode. Care shall be taken in shallow waters, undercut banks, near structures such as wood, or where fish can be concentrated in high numbers because in such areas the fish are more likely to come into close contact with the anode.

g. Electrofishing shall be performed in a manner that minimizes harm to fish. The stream segment shall be worked systematically, moving the anode continuously in a herringbone pattern through the water. Do not electrofish one area for an extended period of time. Remove fish from the electrical field immediately; do not hold fish in net while continuing to net additional fish.

h. Carefully observe the condition of the excluded fish. Dark bands on the body and longer recovery times are signs of injury or handling stress. When such signs are noted, the settings for the electrofishing unit may need adjusting. ESA specimens will be released immediately upstream of the block nets in an area that provides refuge. Each fish shall be completely revived before releasing (see iii below).

i. A healthy environment for the stressed fish must be provided, with no overcrowding in the buckets, and the holding time minimized. Large fish shall be kept separated from smaller prey-sized fish to avoid predation during containment. Water to water transfers, the use of shaded, dark containers and supplemental oxygen shall be considered in designing fish handling operations.

4. Trapping using minnow traps. Traps will be left in place between each pass.

5. When removing fish out of the isolated stream reach, all attempts to remove fish out of the existing stream crossing structure shall be made. Connecting rod snakes may be used to help get the fish to move out of the structure. The connecting rod snake is inserted and wiggled through the pipe or other structure to get the fish to move out so they can be captured and removed out of the stream reach. The connecting rod snake is made of wood sections with metal couplers with sections approximately three feet in length. As the snake is wiggled slowly through the pipe, noise and turbulence will help to get the fish to move out without harming them.

6. Pumps used to temporarily bypass water around work sites shall be fitted with mesh screens to prevent aquatic life from entering the trash pump hose. The screens shall be installed as a precautionary measure to prevent any fish and other wildlife which may have been missed in the fish exclusion process. The screens will also prevent fish and other wildlife from entering the trash pump if a block net should fail. Screens will be placed approximately 2-4 feet from the inlet of the trash pump hose to avoid the suction of the trash pump.

iii. Fish Release: for the period between capture and release, all captured aquatic life shall be immediately put in dark colored five gallon buckets filled with clean stream

water(sediment levels not exceeding natural background of stream flow). Frequent monitoring of bucket temperature and well being of the specimens will be done to assure that all specimens will be released unharmed. Any injuries or mortalities to ESA listed or proposed species will be documented and reported to the Corps, NMFS, and USFWS. Any fish killed that are identified or suspected as listed or proposed species shall be provided to NMFS or the USFWS, depending on which agency has jurisdiction over that species. Captured aquatic life will be released upstream of the isolated stream reach in a pool or area which provides some cover and flow refuge.

EXCEPTION: The fish removal protocols and standards identified in this conservation measure may be modified by a project specific plan developed by the project proponent and approved by the Corps and Services via the tiered consultation procedures. Electroshocking may be implemented only if approved as part of a project-specific plan.

p. Hand labor crews will complete all portions of projects that do not require major excavation or grading (requiring movement of greater than 3 cubic yards of material from one location) or movement of large objects (such as woody debris larger than 1 foot, diameter breast height).

q. Washing of replacement substrate shall not occur where the wash water can enter any stream, watercourse, or wetland.

r. No uncured concrete shall come into contact with the waterbody. Washout of concrete trucks and equipment is prohibited within 250 feet landward of the edge of any stream, lake or wetland, unless dedicated washout facilities designed to treat the wash water are used. Wash water shall not enter into any waterbody prior to meeting Washington State Water Quality Standards (WAC 173-210A).

s. Erosion and Sediment Control Protocols and Standards: Erosion and sediment control (ESC) measures must be designed and implemented before there is any opportunity for storm runoff to create erosion. Project designs shall emphasize erosion control rather than sediment control. The following are summaries of the principles and specific measures to be used during any construction projects where erosion and sediment problems could arise:

   i. If rain falls during construction, and ESC measures are not adequate to maintain water quality downstream of the site (per WAC 173-210A or current standard), then all construction activities, except for those necessary to stabilize the site, shall stop until the storm ceases and downstream water quality has returned to pre-storm conditions. The ESC measures must be re-designed to address the deficiencies, approved by the Corps, and installed prior to re-starting construction.
   ii. Install construction entrances that have been designed and stabilized to reduce the amount of sediment transported off-site by construction vehicles and to reduce the area disturbed by vehicle traffic.

iii. Prior to any clearing or grading, minimize the extent of site disturbance by delineating construction limits with flagging and/or fencing.
iv. To minimize the duration of area exposed, projects will be completed as quickly as possible without compromising the quality of work and disturbed areas shall be stabilized within 3 days of the end of construction.

- Temporary and permanent cover measures shall be provided to protect disturbed areas (e.g. erosion control and blankets, plastic covering, mulching, seeding or sodding). Temporary cover shall be installed if any cleared or graded area is to remain un-worked for more than seven days from June 1- Sept. 30; and for more than two days from Oct. 1 - May 31. Temporary cover shall be completed within 12 hours of cessation of work in areas that will remain un-worked for the specified time periods. As long as the covering remains in place, planting or seeding is not required in covered areas until conditions are appropriate for growth.

- All disturbed areas will be re-planted with native vegetation within three days of the end of construction, unless covered or otherwise stabilized with appropriate erosion and sediment control measures. Planting shall be completed no later than March 1 of the year following construction [see Conservation Measure (w)].

v. Sandbags or an equivalent barrier shall be constructed between the project area and the surface water in order to isolate the construction area from high water that might result due to precipitation [see Conservation Measure (n) for temporary bypass requirements].
vi. Reduce the amount of sediment transported beyond the disturbed areas of the construction site by installing and/or maintaining appropriate perimeter protection measures (vegetated strips, brush barriers, silt fences, erosion control curtains) prior to the start of construction.
vii. Preventative measures to minimize wind transport of soil (i.e. water spraying) shall be taken when sediment is likely to be deposited in water. The amount of water sprayed shall be the minimum necessary to prevent airborne dust and sediment.
viii. The site will be thoroughly monitored for turbidity and all ESC measures will be maintained until construction is complete and site conditions stabilize. The goal of monitoring activities will be to ensure that water quality is in compliance with the Washington State Water Quality Standards for turbidity (WAC 173-210A-030 or current standards). A minimum of two monitoring stations will be established - one above the project site to establish the background level and one below the site to measure the project's effect on turbidity - the location and required compliance level of which will be determined by state standards (WAC 173-210A or current standard). During construction, turbidity will be measured using a hand-held turbidity meter at least three times per workday. If turbidity exceeds specified state standards and non-compliance zones, work will be stopped and actions taken to reduce and/or eliminate the source of turbid discharge shall be taken until turbidity levels are in compliance. Additional monitoring stations may be established in situations where the Corps' and Services' water quality compliance standards for meeting ESA Section 7 compliance differs from

that of the State.

t. Barriers shall be installed to prevent surface runoff from entering the construction area. To remove particulate matter, water pumped from the construction area shall be treated prior to reintroduction to a storm drainage system, stream, wetland, or other waterbody. Water discharged from the site shall not cause erosion at or near the outfall location and shall meet state water quality standards (WAC 173-210A or current standard).

u. Upon project completion, all waste from project activities will be removed from the project site.

v. Sandbags shall be filled with washed material, 3.0 mm or greater in diameter, or shall be composed of impermeable material and sufficiently sealed so as to prevent the delivery of fine sediments (<3.0 mm) into the affected watercourse. All sandbags shall be removed from the affected waterway and disposed or stored above the ordinary high water mark of the affected stream. The sandbags shall be removed at the earliest possible opportunity once ambient stream flow conditions recover to the obviation of the fish passage or fish survival emergency. In each case, sandbags will be removed prior to 1 November. In the event that the installation of sandbags has the potential to strand fish near channel margins, fish capture and rescue procedures shall be conducted in accordance with conservation measure (O) to the extent that the provisions therein apply.

w. Site inspections will be performed by a qualified biologist after project completion to assure that the project is progressing as planned and that there are no unintended consequences to fish, wildlife and plant species and their habitat. Detailed inspections will be made on all construction projects immediately following the onset of rainy season - with inspections during or immediately after the first freshet following construction. Any necessary corrective measures must be evaluated with respect to their urgency and potential effects on listed species, and must be agreed upon by the Corps before implementation. Corrective measures requiring in-stream work or other work likely to cause erosion will be implemented during the following work window.

x. Riparian Planting: No later than March 1 of the year following construction, native vegetation shall be re-planted in all areas where riparian vegetation was removed or degraded during construction. Along with other project documentation, the project proponent shall submit a planting plan that includes the location, species and density of the proposed riparian plantings, a planting schedule, performance standards, monitoring schedule, and contingency measures. [Details of the monitoring requirements can be found in the "Individual Project Monitoring" section of this programmatic biological assessment.]

y. Monitoring for Fish Passage Conditions: Culvert replacements and modifications will be monitored by qualified personnel for passage of the target fish species and life history stage during summer, high (greater than or equal to the 5-year flow event) and bankfull discharge or for six years, whichever is sooner. Monitoring shall document the hydraulic conditions

(depth, velocity, elevation drop at inlet, outlet, and within the culvert/under the bridge) around and through the structure at each of the stated flow thresholds. In the event that the project does not meet the velocity, flow, depth, and elevation drop standards to allow passage of the target fish species and life history stages, the permittee shall implement corrective actions necessary to allow fish passage of the target species at the project site.

II. STATUS OF THE SPECIES AND CRITICAL HABITAT

The action area is defined by NMFS regulations (50 CFR 402) as "all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action." The action area for the programmatic BA and this Opinion is the State of Washington, specifically any streams that contain listed anadromous salmonids under NMFS' ESA responsibility. Essential habitat features for salmonids are: substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions. The proposed activities described in the programmatic BA may affect all of these essential habitat features.

References for further background on listing status, biological information and critical habitat elements can be found in Table 1.

Table 1. References for additional background on listing status, critical habitat, protective regulations, and biological information for the listed species addressed in this Biological Review.

Species	Listing Status	Critical habitat	Protective Regulations	Biological Information, Population Trends
Snake River sockeye salmon	November 20, 1991, 56 FR 58619 Endangered	December 28, 1993, 58 FR 68543	ESA prohibition on take applies	Waples *et al.* 1991a; Burgner 1991; ODFW and WDFW 1998
Ozette Lake Sockeye	March 25, 1999, 64 FR 14508, Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Gustafson *et al.* 1997; WDFW 1993
Hood Canal Summer-run Chum Salmon	March 25, 1999, 64 FR 14508, Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Johnson *et al.*1997; WDFW 1993
Upper Columbia River steelhead	August 18, 1997, 62 FR 43937 Endangered	February 16, 2000 65 FR 7764	ESA prohibition on take applies	Busby *et al.* 1995; Busby *et al.* 1996; ODFW and WDFW 1998; WDFW 1993
Snake River Basin steelhead	August 18, 1997, 62 FR 43937 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Busby *et al.* 1995; Busby *et al.* 1996; ODFW and WDFW 1998
Lower Columbia River steelhead	March 19, 1998, 63 FR 13347 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Busby *et al.* 1995; Busby *et al.* 1996; ODFW and WDFW 1998
Upper Willamette River steelhead	March 25, 1999, 64 FR 14517 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Busby *et al.* 1995; Busby *et al.* 1996; ODFW and WDFW 1998

Middle Columbia River steelhead	March 25, 1999, 64 FR 14517 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Busby *et al.* 1995; Busby *et al.* 1996; ODFW and WDFW 1998; WDFW 1993
Columbia River chum salmon	March 25, 1999, 64 FR 14508 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Johnson *et al.*1997; Salo 1991; ODFW and WDFW 1998; WDFW 1993
Snake River Fall chinook salmon	April 22, 1992, 57 FR 14653 Threatened	December 28, 1993, 58 FR 68543	July 22, 1992 57 FR 14653	Waples *et al.* 1991b; Healey 1991; ODFW and WDFW 1998
Lower Columbia River chinook salmon	March 24, 1999, 64 FR 14308 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Myers *et al.*1998; Healey 1991; ODFW and WDFW 1998; WDFW 1993
Snake River spring/summer chinook salmon	April 22, 1992, 57 FR 14653 Threatened	December 28, 1993, 58 FR 68543 and October 25, 1999, 64 FR 57399	April 22, 1992 57 FR 14653	Matthews and Waples 1991; Healey 1991; ODFW and WDFW 1998
Upper Willamette River chinook salmon	March 24, 1999, 64 FR 14308 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Myers *et al.*1998; Healey 1991; ODFW and WDFW 1998
Puget Sound chinook salmon	March 24, 1999, 64 FR 14308, Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Myers *et al* 1998; WDFW 1993
Upper Columbia River spring run chinook salmon	March 24, 1999, 64 FR 14308 Endangered	February 16, 2000 65 FR 7764	ESA prohibition on take applies	Myers *et al.*1998; Healey 1991; ODFW and WDFW 1998; WDFW 1993

III. 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). NMFS 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, NMFS 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, NMFS 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 NMFS finds that the action is likely to jeopardize, NMFS must identify reasonable and prudent alternatives for the action.

NMFS also evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' critical habitat. The NMFS must determine whether habitat

modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. The NMFS identifies those effects of the action that impair the function of any essential feature of critical habitat. The NMFS then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NMFS concludes that the action will adversely modify critical habitat, it must identify any reasonable and prudent alternatives available.

NMFS has developed an analytic methodology for evaluating these effects (Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale, NMFS, 1996.) It is often referred to as the Matrix of Pathways and Indicators, or MPI. In the MPI framework, the pathways for determining the effect of an action are represented as six conceptual groupings (e.g., water quality, channel condition) of a suite of habitat condition indicators. The indicators constitute the habitat aspects of a species' biological requirements--the essential physical features that support spawning, incubation, rearing, feeding, sheltering, migration, and other behaviors. Such features include adequate instream flow, pure cold water, loose gravel for spawning, unimpeded fish passage, deep pools, and abundant large tree trunks and root wads. Indicator criteria (mostly numeric, though some are narrative) are provided for three levels of environmental baseline condition: Properly functioning, at risk, and not properly functioning. The effect of the action upon each indicator is classified by whether it will restore, maintain, or degrade the indicator.

Although the indicators used to assess functioning condition may entail instantaneous measurements, they are chosen, using the best available science, to detect the health of underlying processes, not static characteristics. "Best available science" advances through time. This advance allows PFC indicators to be refined, new threats to be assessed, and species' status and trends to be better understood. River habitats are inherently dynamic, and the PFC concept recognizes that natural patterns of habitat disturbance will continue to occur. Floods, landslides, windstorms, and fires all result in spatial and temporal variability in habitat characteristics, as do human activities. Unique physiographic and geologic features may cause PFC indicators to vary between different landscapes. For example, aquatic habitats on timberlands in glacial mountain valleys are controlled by natural processes operating at different scales and rates than are habitats on low-elevation coastal rivers. The MPI provides a consistent, but geographically adaptable, framework for making effect determinations. The pathways and indicators, as well as the ranges of their associated criteria, may be altered through the watershed analysis process.

For the proposed action, NMFS' jeopardy analysis considers direct or indirect mortality of fish attributable to the action. NMFS' critical habitat analysis considers the extent to which the proposed action impairs the function of essential elements necessary for migration, spawning, and rearing of the listed species under the existing environmental baseline.

A. Biological Requirements

The first step in the method NMFS 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. NMFS also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess to the current status of the listed species, NMFS 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 salmonids to survive and recover to naturally reproducing population levels at which protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For this consultation, the relevant biological requirement is restored habitat access. Improved access would make habitat available that functions to support successful spawning, incubation and migration, rearing habitat and over-wintering refugia. Salmon survival in the wild depends upon the proper functioning of certain ecosystem processes, including habitat formation and maintenance. Restoring functional habitats and habitat access depends largely on allowing natural processes to increase their ecological function, while at the same time removing adverse impacts of current practices. In conducting analyses of habitat-altering actions, NMFS usually defines the biological requirements in terms of a concept called Properly Functioning Condition (PFC) and utilizes a "habitat approach" to its analysis.[4] The current status of listed salmonids in the State of Washington, based upon their risk of extinction, has not significantly improved since the species were listed. The NMFS is not aware of any new data that would indicate otherwise.

B. Environmental Baseline

ESA regulations (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. The environmental baseline also includes the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation, and the impacts of State and private actions that are contemporaneous with the 4(d) submittal and review process. The action area is defined to mean "all areas to be affected directly or indirectly by the ... action and not merely the immediate area involved in the action."

For the purpose of this consultation, the action area includes all waters throughout the State of Washington and within the range of listed salmon and steelhead. The action area may extend upstream or downstream of permitted projects, based on their potential to affect fish passage, riparian succession, the hydrologic cycle, the erosion, transportation, and deposition of sediments, and other ecological processes related to the formation and maintenance of salmon

[4] National Marine Fisheries Service, Northwest Region. 26 August 1999. The Habitat Approach: Implementation of Section 7 of the Endangered Species Act for Actions Affecting the Habitat of Pacific Anadromous Salmonids. Guidance memorandum from Assistant Regional Administrators for Habitat Conservation and Protected Resources to staff. 13 pages. NMFS, 525 NE Oregon St, Ste 500, Portland, OR 97232-2737.

habitats. Indirect effects may occur throughout the watershed where other activities depend on Regional Program activities for their justification or usefulness.

The scale of the action area covered in this programmatic consultation is so large that describing the environmental baseline is a matter of generally describing the existing condition of habitat elements, statewide. To enable such a general description of habitat conditions the NMFS summarizes status information reported in *Changing Our Water Ways: Trends in Washington's Water Systems*, published by the Washington State Department of Natural Resources (DNR) in December 2000. That document reviews the trends affecting aquatic resources statewide.

Decline in the status of salmon and steelhead in Washington State is attributed to myriad factors, including habitat functional quality and amount. Both natural and human-induced activity have contributed to this decline; under formal consultation we focus primarily on human activities. Natural disturbances are usually relatively short in duration and occur infrequently. While human disturbances may have minimal impacts individually, the number, magnitude, duration, and cumulative impacts since Euro-American settlement combine to form the primary cause of the decline of numerous salmon stocks. Historical and current human-caused disturbances include: Clearing and channelizing rivers, sending logs down streams via splash dams, extensive land clearing, diverting water, livestock grazing in waterways, mining run-off, constructing logging roads and accelerating erosion, removing old growth forests, filling and diking of wetlands and estuaries, armoring shorelines and streambanks, developing hydroelectric dams, creating barriers to fish migration, increasing surface run-off, contaminating water and sediments, introducing non-native plants and animals, changing levels of oxygen and nutrients in waterways and over fishing.

Human activity and development can have significant and damaging impacts on the environment, and today's growing population means that there will be increasing pressure on the state's natural resources. Washington's population – 5.8 million in 2000– is expected to increase by nearly 2 million by the year 2020. In 1999, 46,000 more people were added to the state. Adding this many people leads to concerns about how to provide clean and adequate water for fish and wildlife. While each watershed is unique, the issues can be grouped into broad categories:

- Interrupting the flow of water
- Alterations to aquatic ecosystems
- Shoreline modifications
- Effects of shipping and transportation
- Pollution

Interrupted flow regime

Today, there are 1,025 dams obstructing the flow of water in Washington; this number includes any structure than can store 10 or more acre-feet of water. Because dams obstruct the flow of rivers, they change the physical flow of water, resulting in areas that are either drier than normal

or flooded. Changing the depth and flow of rivers also affects the water's temperature.

Dams also change the flow of materials carried in river water. They stop the flow of debris, nutrients, and sediments. As a result, reservoirs eventually fill with sediments and inadequate amounts of sediments reach the deltas and estuaries. Dams also change the movement of fish migrating between the streams and oceans. In addition to the many dams blocking fish movement, an estimated 2,400 human-made barriers, including dikes, culverts and tide gates block passage to an estimated 3,000 miles of freshwater spawning and rearing habitat.

In a more recent report, the WDFW indicates there is a minimum of 2,400-4,000 human-made barriers blocking 3,000-4,500 miles of freshwater spawning and rearing habitat for salmon.[5] A recent critique of the Washington State Hydraulic Code estimated that there are approximately 8,800 culvert related barriers blocking over 6,000 miles of habitat. The authors estimated an annual lost opportunity of 10 million adult salmon. (Hollowed and Wasserman, 2000)

In many river basins, irrigation projects have significantly changed the timing, quantity and quality of flow in the rivers and tributaries. Flood control dikes and highway construction have cut off the rivers from their historic flood plains and wetlands, resulting in habitat destruction, changes in stream temperature and nutrient composition alterations. In the Yakima River Basin, these changes have contributed to the reduction of historically abundant runs of salmon and steelhead. Today, summer chinook, native coho and anadromous sockeye are extinct and spring chinook declined from 9,300 in 1986 to 645 in 1997.

Sometimes human impacts and natural events combine to change the flow of a river. The natural course of a river includes its flood plain. In what is known as avulsion, a surface mine pit located in a flood plain may suddenly reroute a river during a flood, "capturing" the river. Gravel spawning beds or other habitat in an abandoned channel become unavailable to fish. Gravel from upstream gradually fills the breached mine pit instead of getting washed downstream to replenish gravel bars. The river becomes less stable and less hospitable to salmon. When the east fork of the Lewis River was captured in 1995, it abandoned 1,700 feet of gravel spawning beds, and when captured again in 1996 it abandoned another 3,200 feet.

The availability of water has long been a major issue for all Washington residents, including its aquatic species. Today, decisions about apportioning the flow--who gets water and how much they get--is a hot topic debated by local, state, and federal governments, businesses and private landowners. Of Washington's 62 Water Resource Inventory Areas, 16 have both an ESA-listed salmon stock and a water-supply problem. There is not enough water to supply the water rights granted to people in those 16 basins and to also support fish and water quality in those streams. In addition, about 450 lakes and streams in Washington are partially or completely closed to further withdrawals.

With 5.8 million people living in Washington, much of the land surface has been covered by

[5]SSHB 2879 Fish Passage Barrier Removal Grant Program Report, WSDOT and WDFW, January 1999.

impervious surfaces. All this development affects the amount of water that seeps into the ground and washes into streams; it also affects how quickly the water gets there. When land is covered with pavement or buildings, the area available for rainwater and snowmelt to seep into the ground and replenish the groundwater is drastically reduced; in many urban areas it is virtually eliminated. The natural movement of water through the ground to usual discharge points such as springs and streams is altered. Instead, the natural flow is replaced by storm sewers or by more concentrated entrance points of water into the ground.

Changing the timing and amount of water run-off can lead to too much water going directly into streams in the rainy months of winter instead of soaking into the ground. Consequently, there isn't enough water in the ground to slowly release into streams in the dry months of summer. Too much water in the winter can cause fish habitat to be scoured by unnaturally swift currents; not enough water in streams in the summer leads to water temperatures too high to support fish.

Studies show that when impervious surfaces such as pavement and buildings cover between 5 percent to 8 percent of an urban watershed, the health of streams and the fish in them declines, despite stormwater controls. In the south Puget Sound area, most urban watersheds are 20 percent to 40 percent covered with hard surfaces, altering stream flows, water temperatures, and in-stream habitat for everything from insects to fish (May 1996).

Altered Aquatic Ecosystems

From high mountain streams to coastal shorelines, Washington's varied landscapes provide diverse aquatic habitats. Since the arrival of settlers in the early 1800s, at least 50 percent and as much as 90 percent of riparian habitat in Washington has been lost or extensively modified.

Wetlands improve water quality by filtering out sediments, nutrients, and toxic chemicals. However, research shows that a watershed can withstand having only 5 percent to 8 percent of its land base covered with buildings, roads, and other impervious surfaces before significant changes in wetland functions and stream hydrology begin to occur. Because the value of wetlands and their overall environmental importance have been recognized only recently, Washington has almost two centuries of wetland conversion. A 1989 report by the U.S. Fish and Wildlife Service estimated that activities such as draining and filling reduced Washington's wetland areas by 33 percent since statehood, from 1.4 million acres to 938,000 acres (Canning and Stevens 2000).

Estuary losses have occurred primarily through conversions to farms and cities. In the Skagit Valley, for example, a large majority of the estuary mud flats and flood plain was converted to farmland before the first land surveys of 1889. Nearly 75 percent of the wetland area was lost before statehood. Currently less than 3 square miles of tidal estuary wetland remain, a 93 percent loss.

When tidal flood plains, estuaries and tide floats are destroyed or significantly disturbed, critical functions are at risk. The vast food source is diminished and silt that is carried along by currents

to replenish beaches and nearshore habitat is lost. Replacing estuaries with farms, industry, and cities destroys habitat critically needed by salmon.

Eelgrass, a marine flowering plant, grows low in the intertidal zone and in mud and sand in the shallow subtidal zone. It is critical to salmon recovery efforts because it provides fish a place to hide and evade predators. It also provides food and habitat for salmon prey. Because of where it grows, eelgrass is largely inaccessible and hard to survey. As a result, it's unclear how much eelgrass has disappeared from Puget Sound waters over the past 100 years. However, the historical data that scientists do have suggest that eelgrass beds in Bellingham Bay have declined by about 50 percent over the past 100 years; a figure fairly consistent throughout it's range in Washington.

The amount of dissolved oxygen in water is an important measurement of overall water quality. Areas of Puget Sound are experiencing lower levels of dissolved oxygen. In March 2000, the Puget Sound Water Quality Action Team identified 87 areas in Puget Sound that had problems with low dissolved oxygen. Human actions are the main contributor to depleted oxygen. Excessive fertilizers and nitrogen applied to yards and fields, and fecal matter from septic fields and failing septic systems, contribute pathogens and nutrients that can deplete oxygen. Because there is little historical data on dissolved oxygen concentrations in marine waters, it is difficult to compare the health of Washington's marine waters of today to those of the past. However, based on measurements of dissolved oxygen in the southern part of Hood Canal made in the 1950s and 1960s, today's dissolved oxygen concentrations are lower, more frequently.

The introduction of non-native (exotic) species has been known to profoundly affect ecosystems by disrupting food webs and displacing native species. Because of a lack of natural predators or competitors, these introduced species can spread rapidly. In 1998, an expedition looked in Puget Sound for non-native species, and discovered more than 52 invasive species. Non-native species are introduced primarily through shipping, aquaculture, research, and aquaria industries. The following are examples of some of the most tenacious and insidious non-native species that have invaded Washington's waters and aquatic ecosystems:

- Eurasian Water Milfoil, an aquatic plant found in lakes and slow-moving streams. It can lower dissolved oxygen and increase pH; displace native aquatic plants and increase water temperature.

- Parrotfeather is limited to coastal lakes and streams, the Columbia River, the Chehalis River and private ponds and lakes. The emergent stems shade the water column, eliminating algal growth, which is the basis of the aquatic food web.

- Purple Loosestrife generally grows in marshes, ponds, streambanks, ditches and lake shores. Because it grows so aggressively, large stands take over an area and eventually replace the native plant species, eliminating the natural food and cover essential to native shoreline and wetland inhabitants.

- Hydrilla roots in lake sediments and grows rapidly under very low light conditions. Hydrilla can fill the water column with vegetation, displacing native fish and wildlife.

- Spartina is an exotic species of intertidal cordgrass. If left uncontrolled, Spartina transforms mud flats into dense, raised meadows, cut by narrow, deep channels. The loss of mud flats, eelgrass, and algae directly affect native fish species that depend on these areas for feeding, spawning and rearing.

Shoreline Modification

Washington has more than 3,000 miles of marine shoreline. When these shorelines are changed or eradicated, intertidal and nearshore habitat is affected or lost, causing significant stress on the salmon that rely on these habitats. Modifications of shorelines include bulkheads, docks, piers, or areas that have been filled or dredged.

Few statistics exist on the extent of freshwater shoreline modification. One lake that has received some attention is Lake Washington, in Seattle. More than 80 percent of its shoreline has been armored against erosion and over 3000 residential piers cover approximately 2.5 percent of the lake's surface. Adverse effects of these shoreline modifications include loss of riparian vegetation, shading of the nearshore aquatic zone, and an increase in attractive refugia for piscivorous birds and fish.

Development of Washington's marine and estuarine shoreline over the past 100 years has created a landscape that is dramatically different from what the first settlers found. About 800 miles of the Puget Sound shoreline have been modified, with 25 percent of the modifications in the intertidal areas. Up to 52 percent of the central Puget Sound shoreline and about 35 percent of the shorelines of Whidbey Island, Hood Canal, and south Puget Sound have been changed or eradicated. To help protect their shoreline property from erosion, many waterfront homeowners construct bulkheads between their land and the beach. Ironically, one consequence of bulkheads is the loss of sand from the beach and beach erosion. The natural process of bluff erosion provides a supply of sand and rocks to the beach. Construction of bulkheads cuts off this supply of beach-building material and prevents the wave's energy from dissipating. A 1998 survey in Puget Sound found that nearly 15 percent of armored beaches had mostly large rocks and minimal sediment compared to only one percent of unarmored beaches. The loss of sand and pebbles affects small fish that use this habitat for spawning. These small fish form the base of the food chain for larger fish.

The Shoreline Management Act was passed in 1971 to protect the state's shorelines from development impacts. However, since passage of the Act, about 26,000 permits have been issued statewide for substantial shoreline development projects. This number does not include single family homes, which are exempt from the permit process.

Shipping and Transportation

Since the days of early settlement, marine shipping has played a key role in the state's economy, and ports are the critical hub of this waterborne trade. Early dredging, filling, and other alterations of shallow estuarine areas were devastating to the fish that depended on the habitat as a transition from freshwater to saltwater. Over time, the increased demand for shipping facilities led to more dredging and filling until today an average of 50 percent of the original wetland habitat in Puget Sound's major bays has been destroyed. Bays near urban centers such as Tacoma and Seattle have less than 5 percent of their natural intertidal habitat left.

There are 48 ports in Washington's waters. The total tonnage shipped from those ports has increased 60 percent over the past five decades, and shipping container traffic is expected to double in the next 20 years. Not only are there more ships, but the ships are being built bigger. To accommodate larger ships, ports expand and shipping channels are dredged deeper. Dredging the bottom of bays and rivers displaces plants and animals living there and can stir up contaminated sediments. Dumping dredged materials elsewhere in the water smothers habitat.

In the late 1990s, the Army Corps of Engineers proposed deepening the Columbia River's existing navigation channel to accommodate larger ships. Over the 50-year life of the project, the deeper channel will result in 267 million cubic yards of material which would need to be disposed in the river, in the ocean, or on land. The disposal of dredged material will result in the loss of at least 67 acres of habitat in the river, 200 acres of agricultural land, and 20 acres of wetlands. The dredging project will alter the critical habitat of at least 13 species of listed salmon, damage prey species stocks, and alter the food web.

Ports expand to accommodate not only more ships, but larger ships as well. The shipping industry continually builds larger ships to carry larger cargo loads. In response, ports enlarge their facilities and deepen their navigation channels so that larger vessels can dock and unload their goods. The larger vessels carry more ballast water, which when dumped into Washington's waters has the potential of introducing exotic species. Increased shipping activity affects more than just the waterfront–it also results in an increased need for overland transportation. More trucks and rail cars are needed to transfer goods to and from ships and inland destinations. Aquatic ecosystems are at risk of becoming polluted by more petroleum-carrying run-off from increased traffic on roads.

Pollutants

Washington is rich in water resources, but there are unseen risks in many of the state's water bodies. Of the 1,099 lakes, streams, and estuaries for which there is data, 643 (59 percent) are so impaired they don't adequately provide for swimming, fishing or habitat. The main causes of water quality problems are related to human activities, such as farming, failing septic systems, increased erosion along streams, and pollutants added to land and water.

The mud and sand in many places beneath Washington's waters are so contaminated they don't

meet state and federal standards. More than 3,000 acres of Puget Sound sediments are so contaminated that federal laws require they be cleaned up. Of the state's112 contaminated sites identified by the Washington State Department of Ecology, 93 are in saltwater and 19 are in freshwater. Contaminated sediments are detrimental to the health and diversity of aquatic populations.

Declines in Fish

Salmon provide critical links in an entire food web. They transport energy and nutrients between the ocean, estuaries, and freshwater environments, even in death. Recent calculations indicate that only three percent of the marine nutrients once delivered by anadromous salmon to the rivers of Puget Sound, the Washington Coast, and the Columbia River are currently reaching those streams. Researchers surmise this is due to the substantial decline in salmon populations over the past several decades.

The decline in salmon over the past several decades is the result of both natural and human factors. Forestry, agriculture, mining, and urbanization have degraded, simplified, and fragmented habitat. Water diversions for agriculture, flood control, domestic, and hydro power purposes have greatly reduce or eliminated historically accessible habitat. Studies indicate that in most western states, about 80% to 90% of the historic riparian habitat has been eliminated (NMFS, 1998).

Conclusion

In its conclusions, *Changing our Water Ways* makes it clear that our efforts to resolve resource problems in the past have led to the cumulative effects of dams, agricultural practices, urban development, and industrial activity. Existing policies and programs may not be sufficient to address current environmental challenges. Washington's aquatic habitat has disappeared or is so impaired it no longer supports life the way it used to; populations of many aquatic animals, including listed salmon, are in serious decline. Water quality is poor and riparian structure and function has been significantly altered from historical conditions.

NMFS concludes that not all of the biological requirements of the species within the action area are being met under current conditions, based on the best available information on the status of the affected species; information regarding population status, trends, and genetics; and the environmental baseline within the action area. Significant improvement in habitat conditions over those currently available under the environmental baseline is needed to meet the biological requirements for survival and recovery of these species. Any further degradation of these conditions would have a significant impact due to the amount of risk they presently face under the environmental baseline.

IV. ANALYSIS OF EFFECTS

A. Effects of the Proposed Actions

The COE BA states:

> "This programmatic consultation is intended for those activities requiring a Department of the Army permit for the purpose of restoration and rehabilitation of habitat for native species in the state of Washington. For the purpose of this programmatic consultation, restoration is defined as "an activity whose primary purpose is to return a natural aquatic, riparian or wetland habitat to its properly functioning condition." Rehabilitation is defined as "an activity whose primary purpose is to create or enhance functions or processes limited or lacking within the natural aquatic, riparian or wetland habitat."
>
> "The Corps is consulting with the Services on a state-wide level for all restoration/rehabilitation activities described herein for impacts that may occur to listed or proposed species within the state of Washington. *The goal of this programmatic consultation is to further the protection and recovery of threatened and endangered species through consistent guidelines for restoration activities and an abbreviated consultation procedure*"(*emphasis added*).

Using the above 'intended use' language as a backdrop, NMFS provides analysis of the short-term negative impacts of project construction versus the long-term positive impacts of anadromous salmonid access to historic habitats.

The four project categories have the common goal of providing unimpeded, or at least improved in the case of tide gate projects, fish passage to upstream habitats currently under-utilized by anadromous salmonids. As noted in the environmental baseline section an estimated 2,400 human-made barriers, including dikes, culverts and tide gates block passage to an estimated 3,000 miles of freshwater spawning and rearing habitat. Any significant contribution to reducing this number of passage barriers will have obvious long-term beneficial effects on salmonid production. WDFW in cooperation with Washington Department of Transportation has surveyed and established a ranking of passage barriers on state highways. Likewise, surveying and confirming passage barrier status on local government and private roads is an ongoing effort. The limiting factors assessments information provided in Table IV-4 lists several basins that have passage issues listed.

Of greater difficulty and concern is the issue of establishing that certain debris jams and sediment bars are barriers to anadromous species passage. If the mere presence of in-stream structure constituted a passage barrier worthy of removal then all beaver dams and log collections would be targeted for such action. What may appear to be a passage issue during a low flow period may not appear the same during a different flow regime. Making the judgement to remove certain debris jams or sediment bars to facilitate passage will require careful consideration by persons knowledgeable with species run-timing and movement characteristics. NMFS believes if such a decision is to be made it should be made through the expertise of the co-managers of salmonid resources in the State of Washington in consultation with the COE and

the Services.

Mullan et al. (1992) reported densities of 0+ chinook in the Icicle Creek Index Area ranging from .6 to 93.7/100 m^2. Bilby reported average salmonid densities of .4 to .8 per m^2 for basins in southwest Washington. (Bilby, unpublished). A report completed for the Tulalip Tribes and Snohomish County Department of Public works found that disconnection and destruction of off-channel habitat had eliminated approximately 95% of chinook salmon rearing capacity in the Snohomish River floodplain. Using information from British Columbia, the report estimates a chinook rearing density of 854 pre-smolts/hectare from floodplain ponds (Haas 2001) as might be associated with tide-gated tidal sloughs. The multiplier effect of 3000 linear miles of freshwater streams suggests a potentially significant beneficial affect from these types of projects. Using a conservative figure for salmonid rearing as reported by Bilby in small streams could still produce several thousand additional salmonids into a population. The additional beneficial impact of habitat access enjoyed by non-listed salmonids that none-the-less contribute to the biological integrity of the system further multiplies the positive contribution of these projects. The long-term benefit of re-establishing fish passage to these spawning and rearing habitats will, when weighed against the effects of construction with conservation measures, outweigh the short term effects of project construction.

In the short-term, work associated with these passage restoration activities could result in the disturbance of salmonids through turbidity, noise, contact (or near-contact) with equipment, compaction and disturbance of instream gravel from heavy equipment, and modification to adjacent riparian areas. Juvenile fish that may be rearing in the vicinity of the action area would most likely be displaced, although working during the in-water work period would decrease the risk of fish presence.

The effects of suspended sediment and turbidity on fish are reported in the literature as ranging from beneficial to detrimental (see below). Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorous fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the season, frequency and the duration of the exposure (not just the TSS concentration).

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Birtwell *et al.* 1984, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (McLeay *et al.* 1984, 1987, Sigler *et al.* 1984, Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, except when the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a potentially positive reported effect is providing refuge and cover from predation (Gregory and Levings 1988).

Fish that remain in turbid, or elevated TSS, waters experience a reduction in predation from

piscivorous fish and birds (Gregory and Levings 1998). In systems with intense predation pressure, this provides a beneficial trade-off (e.g., enhanced survival) to the cost of potential physical effects (e.g., reduced growth). Turbidity levels of about 23 Nephalometric Turbidity Units (NTU) have been found to minimize bird and fish predation risks (Gregory 1993). Exposure duration is a critical determinant of the occurrence and magnitude of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids appear to be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjorn and Reiser 1991). However, research indicates that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding et al. 1987, Lloyd 1987, Servizi and Martens 1991).

At moderate levels, turbidity has the potential to adversely affect primary and secondary productivity, and at high levels, has the potential to injure and kill adult and juvenile fish. Turbidity might also interfere with feeding (Spence *et al.* 1996). Newly emerged salmonid fry may be vulnerable to even moderate amounts of turbidity (Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al.* 1996), and to reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser 1991). Therefore, there is a low probability of direct mortality from turbidity associated with proposed activities because the turbidity should be localized and brief, and because the work site has been isolated from the fish bearing waters during the construction period.

The discussion above illustrates the full range of reported impacts of suspended solids, turbidity, in the water column. The proposed action(s) will be constructed in isolation from stream flow and therefore introduction and transport of sediments will be non-existent during construction. During re-introduction of the stream to the project site there is a likelihood for some small amount of sediment to be introduced to the water column. The effects of this will be minimal given that it will also occur in a time frame when the presence of listed species is minimized.

Instream use of heavy equipment compact and disturb stream bed gravels. Excavation in the streambed to place weirs or streambed controls will expose and resuspend fine sediments when stream flow is re-introduced to the channel. Excavation in the stream bed may also destabilize the coarsened surface layer, disturbing the equilibrium between bed load scour and deposition. (Bakke, USFWS pers com.) Compaction and disturbance of stream bed gravels increase difficulty in redd excavation and the ability of the gravels to be aerated, resulting in lost productivity. Cederholm et al. (1997) recommend that heavy equipment work should be performed from the bank and that work within bedrock or boulder/cobble bedded channels should be viewed as a last resort and that least impacting equipment such as low ground pressure equipment be utilized.

Short-term alterations to the adjacent riparian area to facilitate access to the stream result in increases in turbidity and loss of vegetation. The loss of vegetation may result in some small amount of increased solar radiation and subsequent small increase in stream temperature. These effects can be offset through compensatory mitigation.

Conservation measures in the form of BMPs integrated into projects ensure that turbidity issues will be minimized by directing all project construction activities to be conducted in isolation from flowing waters. However, even the activity needed to isolate the stream may cause at least minimal water quality impacts. It is also common that re-introduction of the stream to a newly constructed project will introduce some level of turbid waters downstream and project proposals should include a ramping of flow re-introduction to the project site to minimize this issue.

Conservation measures also direct heavy equipment to work from the banks as much as possible and to avoid entering the stream channel except to make required stream crossings in order that the gravel compaction issues discussed above are minimized or avoided.

Restoring fish passage at existing culvert crossing sites implies that road access is available and that the need for road construction and the associated impacts can be largely avoided. In the case of large fills or dependent on the engineered solution some constructed road access may be required to gain access to the culvert structure itself. Tide gate removal or repair projects also generally suggests levee top access to a project site or as discussed in the BA, water access by boat or barge may be utilized. However, in the case of removal of debris jams or sediment bars or terraces there is no implied pre-existing road access.

The proposed action contemplates in conservation measure (m)(iii) that up to two temporary roads to allow mechanized equipment access may be built at each proposed project site. The proposed action does not specify or limit how much road construction activity may be needed to access these sites. It does not define whether temporary roads may be re-used. It does not specify what measures might be utilized to prevent future non-project related use of the access roads through riparian areas to the streams. This lack of specificity becomes problematic when NMFS attempts to analyze the over-all impacts of this programmatic consultation. NMFS needs some information provided in this consultation to allow it to make a qualitative judgement about the effects of road building activities. Under the Terms and Conditions of this programmatic consultation, NMFS can define and limit road building activity in an attempt to assure that affects are minimized. NMFS can also look to the yearly review of this action to summarize the impacts of road construction activity. This Opinion will address the lack of specificity with terms and conditions in the short-term and will look to the programmatic evaluations to ensure the adequacy of our response.

Direct and indirect effects to salmonids are likely during road construction within riparian areas. Earth-disturbing activities, including excavation, stockpiling, vegetation manipulation, and construction, can result in increased delivery of sediment to streams, and increase turbidity in the water column. The severity of the impact depends on numerous factors including the proximity of the action to the water, amount of ground-disturbing activity, slope, amount of vegetation

removed, and weather. Sediment introduced into streams degrades spawning and incubation habitat, and can negatively affect primary and secondary productivity. This may disrupt feeding and territorial behavior through short-term exposure to turbid water.

Construction of roads near water bodies increases the risk that toxic or harmful substances fall or drain into streams and rivers. Project activities may also result in a spill of hazardous materials, including fuel, oil and grease. These can be acutely toxic to fish at high levels of exposure, and cause acute and chronic lethal or sub-lethal effects to salmonids, aquatic invertebrates, and aquatic and riparian vegetation.

The channelization of the water through the interception of surface and shallow sub-surface flows results in altered flow rates, increasing peak flows and reducing the low summer flows. This results in incised, straighter streams with lower complexity. Construction activities in riparian areas has the potential to degrade the function of the existing riparian habitat by removing vegetation and de-stabilizing stream banks. Potential impacts include the loss of LWD and LWD recruitment, loss of riparian shade and cover, loss of habitat complexity and decreased floodplain interactions.

In fact, in the case of sediment bar removal the BA can only speculate that benefits accruing to passage restoration "likely outweigh" the adverse impacts of such actions. The negative impacts of road construction and the continued presence of roads and their affects on the stream network are well documented. While the conservation measures seek to provide minimizing and mitigating BMPs, NMFS will use terms and conditions contained in the incidental take statement of this Opinion to further define and reduce the potential scope of road building impacts.

The alternative to bar removal in this case is the temporary placement of sandbags on the streambed to channelize water to provide sufficient water depth and flow characteristics to allow for fish passage. Providing for the long-term benefits of moving fish past barriers to spawning and/or rearing habitats has some short-term liabilities. Invertebrate production at the site of sandbag placement will be impacted for the duration of structure placement. The relative impact, however, in comparison to the overall stream system potential is most likely minor. Re-directing flow may also strand rearing fish along stream margins or habitats where flow is directed away from. It is more likely, however, that in areas sufficiently devoid of passage flows that rearing habitats are not likely to persist either. In either case conservation measure (O) will be utilized to capture and move stranded fish, thereby minimizing any potential lethal take associated with this activity.

B. Effects on Critical Habitat

NMFS designates critical habitat based on physical and biological features that are essential to the listed species. Essential features for designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space and safe passage.

Effects to critical habitat from these categories are included in the effects description expressed above.

C. 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." Other activities within the watershed have the potential to impact fish and habitat within the action area. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being (or have been) reviewed through separate section 7 consultation processes.

Non-Federal activities of the same type identified as factors for decline by NMFS and within the action area are expected to increase with a projected 34 percent increase in human population over the next 20 years in Washington (DNR 2000). Thus, NMFS assumes that future private and State actions will continue within the action area, but at increasingly higher levels as population density climbs.

V. CONCLUSIONS

The NMFS has determined, based on the information, analysis, and assumptions described in this Opinion, that the COE's proposed permit conditions (conservation measures) for the four categories of activities are not likely to jeopardize the continued existence of the listed salmon and steelhead shown in Table 1. In arriving at this determination, NMFS considered the status of the listed salmon and steelhead, environmental baseline conditions, the direct and indirect effects of the action, and the cumulative effects of actions anticipated in the action area. The NMFS evaluated the proposed action and found that it would cause short-term adverse degradation of some environmental baseline indicators for listed salmon and steelhead. The placement of stream isolation structures, pumps etc. will cause listed species to abandon feeding and resting sites and seek other shelter. The act of isolating the work site and removing flowing waters has the greatest probability of take as, despite efforts to capture and transfer fish there is at least some probability that not all fish will be successfully captured and transferred. During the re-introduction of stream flow to a completed project there is a likelihood that at least some sediments will be re-suspended and be transported to downstream habitats. Take is expected to be minimal, however, and the proposed action is not expected to result in further degradation of aquatic habitats over the long term. Thus, the effects of the proposed action would not reduce pre-spawning survival, egg-to-smolt survival, or upstream/downstream migration survival rates to a level that would appreciably diminish the likelihood of survival and recovery of proposed or listed fishes, nor is it likely to result in destruction or adverse modification of critical habitats. Additionally, the long-term effects are expected to be beneficial for all the listed ESUs by increasing the likelihood of achieving properly functioning condition.

VI. REINITIATION OF CONSULTATION

Consultation must be reinitiated after five years. It also must reinitiated if: The amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; new information reveals effects of the action may affect listed species in a way not previously considered; the action is modified in a way that causes an effect on listed species that was not previously considered; or a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16). To reinitiate consultation, COE should contact the Habitat Conservation Division (Washington State Office) of NMFS.

VII. INCIDENTAL TAKE STATEMENT

Sections 4 (d) and 9 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 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 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 compliance with the terms and conditions of this incidental take statement.

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

A. Amount or Extent of Take

The NMFS anticipates that the action covered by this Opinion has more than a negligible likelihood of resulting in incidental take of the species listed in Table 1. Effects of actions such as these are largely unquantifiable and are not expected to be measurable as long-term effects on population levels. Therefore, even though NMFS expects some low level incidental take to occur due to the actions covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NMFS to estimate a specific amount of incidental take to the species itself. In instances such as these, the NMFS designates the expected level of take as "unquantifiable." Based on the information in the BA, NMFS anticipates that an unquantifiable amount of incidental take could occur as a result of the actions covered by this Opinion.

However, during the site de-watering and any associated fish capture and relocation effort there

is sufficient information to expect some lethal take to occur as a result of trapping, seining, and electroshocking injury. NMFS expects that the incidence of take will be more prevalent in watersheds where stream type chinook and steelhead may be present in a juvenile rearing life stage during approved work windows. Consequently, NMFS anticipates that at project sites where plunge pool habitats are de-watered in conjunction with capture protocols that as many as 5% of the juvenile salmonids captured could be taken as a result of the projects consulted on. NMFS estimates that in most projects this would result in not more than one or two individual salmonid mortalities. Loss due to failure to capture prior to de-watering will also cause some minor additive factor. In this biological opinion NMFS has determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat. As noted above, the COE is required to reinitiate consultation if this level of take of the listed species is exceeded.

B. Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions in order for the exemption in section 7(a)(2) to apply. The COE has the continuing duty to regulate the activities covered in this incidental take statement. If the COE fails to require the applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) shall lapse. The NMFS believes that activities carried out in a manner consistent with these reasonable and prudent measures, except those otherwise identified, will not necessitate further site-specific consultation. Activities which do not comply with all relevant reasonable and prudent measures will require further individual consultation.

The NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize the likelihood of take of listed fish resulting from implementation of this Opinion. These reasonable and prudent measures would also minimize adverse effects to designated critical habitat.

> A. Site specific activity. Minimize the likelihood of incidental take from activities seeking to restore fish passage that involve; the construction of temporary access roads, use of heavy equipment, earthwork, site restoration, stream bypass systems, or that may otherwise involve in-water or over-water work or affect fish passage by applying permit conditions to avoid or minimize disturbance to riparian and aquatic systems.
>
> B. Project reporting. Ensure the effective administration of this programmatic approach to project review and included efforts to minimize take of listed species by providing for appropriate post project reporting, monitoring and yearly review of project impacts with the Services to ensure this Opinion is meeting its objective of avoiding and/or minimizing take from the permitted activities.

C. Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, COE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity. These terms and conditions are non-discretionary.

A. Site Activity Specific: Protective coverage of this incidental take statement is only applied to proposed actions within the categories of activities considered by this Opinion and limited by these terms and conditions.

1. Project design. Each project will be individually reviewed to ensure that all reasonable alternatives to restore fish passage have been considered and impacts to natural resources have been avoided, minimized and mitigated, and that the following overall project design conditions are met. Complete removal of blockages or replacement with a full-spanning bridge, arch or culvert is preferred. Debris jam and sediment terrace removal proposals will be accompanied by affirmation from appropriate WDFW and Tribal co-managers in support of removing the passage barrier. Affirmation from the co-managers is also required for the placement of sandbags to facilitate fish passage or maintain fish life during periods of extremely low flow.

    a. Steep Gradients. Projects in steeper gradient streams, >4%, that propose to replace a passage blocking culvert with another culvert shall provide an analysis supporting the choice of structure. Applicant shall also provide monitoring data to support that passage is occurring and accepts responsibility to ensure fish passage in perpetuity.
        i. weirs. Weirs are not a preferred passage solution, and should only be installed if absolutely necessary to facilitate passage. Weirs should not be installed in reaches with a gradient of $\leq$4%. If weirs are required as part of any installation, they should be used as follows; proponents should verify the need for weirs by determining the maximum potential for regrade and headcutting at the site/within the reach affected by the installation. Weirs should be placed only within the road prism where possible. Weirs installed outside the road prism should be kept to the minimum number and installed in the minimum length of stream possible. Fish passage barrier removal projects that include the installation of weirs shall be reviewed by NMFS via the tiered consultation process.
        ii. Conservation measures included in the proposed action and this term and condition requires the use of WDFW *Fish Passage Design Criteria At Culverts* for project design. (NOTE: For projects utilizing the stream simulation design criteria the structure sizing criteria is 1.2 X the bed width of the channel plus 2 ft.)

    b. Alluvial Fans. The construction of bridges, arches or culverts shall be designed so as not to impede the formation or protection of alluvial fans and sediment deposition zones. These structures must be designed to accommodate sediment transport and deposition. Structures must span alluvial fans or include alternative design measures that eliminate fan and deposition zone impacts.

c. Minimum area. Construction impacts will be confined to the minimum area necessary to complete the project.

d. In-water work. All work within the active channel of all anadromous fish-bearing streams, or in systems which could potentially contribute sediment or toxicants to downstream fish-bearing systems, will be completed within the WDFW approved in-water work period as specified in Appendix A[6] except as modified by Individual Programmatic Biological Opinion (IPBO) responses. Actions occurring outside this window may require separate section 7 consultations. Projects requiring a state-issued Hydraulic Project Approval (HPA) will follow the included conditions and have the HPA available on site during the construction period. Conflicts between permit conditions and these terms and conditions shall be brought to the attention of WDFW, the COE, and the Services for resolution prior to beginning project construction.
   i. work period extensions. Extensions of the in-water work period, including those for work outside the wetted perimeter of the stream but below the ordinary high water mark must be approved by biologists from NMFS.

e. Isolation of in-water work area. Except for work to install stream isolation structures, i.e. coffer dams, bypass flow devices, pumps and screens etc. all work to remove, repair, and restore fish passage at culverts, tide gates, debris jams, and sediment terraces shall occur in isolation from flowing waters.
   i. fish screen. Any water intake structure authorized under this Opinion must have a fish screen installed, operated and maintained in accordance to NMFS' fish screen criteria.[7]
   ii. conservation measure (n) documents that work will occur in isolation from flowing waters. Project proposals shall include a ramping schedule, to be reviewed for adequacy by the COE, for re-introduction of stream flow to the project site.

f. Pollution and erosion control plan. A Pollution and Erosion Control Plan (PECP) will be developed for each authorized project to prevent point-source pollution related to construction operations. The PECP will contain the pertinent elements listed below and meet requirements of all applicable laws and regulations:
   i. methods that will be used to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.
   ii. methods that will be used to confine and remove and dispose of excess concrete, cement and other mortars or bonding agents, including measures for washout

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[6]The draft work window table is under review and revision by WDFW. When finalized it will replace the matrix provided by the COE. It is provided herein to provide notification that modification of work windows is forthcoming. NMFS expects co-manager cooperation in finalizing the work window product.

[7] National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996)(guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

facilities.

iii. a description of the hazardous products or materials that will be used, including inventory, storage, handling, and monitoring.

iv. a spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on site, proposed methods for disposal of spilled materials, and employee training for spill containment.

v. measures that will be taken to prevent construction debris from falling into any aquatic habitat. Any material that falls into a stream during construction operations will be removed in a manner that has a minimum impact on the streambed and water quality.

g. Temporary access roads. Temporary access roads are designed as follows:

i. no mid-slope or steep slope (greater than 30%) roads will be constructed to access debris jam removal or sediment terrace removal projects.

ii. debris jam projects and sediment terrace projects requiring more than 100 feet of new road construction shall require individual section 7 consultation.

iii. existing roadways or travel paths will be used whenever reasonable. Project proposals to construct any access roads to a project site must receive individual project review and an IPBO from NMFS and must be accompanied by analysis supporting the need for road construction vs. the impacts of using hand labor to remove blockages in the case of debris jams or sediment bars.

iv. temporary road construction for removal of up to the authorized 25 cubic yards of terrace accumulation to allow fish passage is authorized only once a year and road obliteration is required immediately post project.

v. project applicant is responsible to prevent unauthorized access via a temporary road corridor.

vi. where stream crossings are essential, a survey must determine and map any potential spawning habitat within 1,000 feet upstream and downstream.

vii. no stream crossings will occur at known or suspected spawning areas or within 300 feet upstream of such areas where impacts to spawning areas may occur.

viii. where stream crossings are essential, the crossing design will accommodate reasonably foreseeable risks (e.g., flooding and associated bedload and debris) to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.

ix. vehicles and machinery must cross riparian areas and streams at right angles to the main channel wherever reasonable.

x. temporary roads within 150 feet of streams will avoid, minimize and mitigate soil disturbance and compaction by clearing vegetation to ground level and placing clean road bedding, gravel or wood chips, over geotextile fabric. The fill and fabric is to be removed upon project completion, during road obliteration.

xi. the number of stream crossings is minimized.

h. Cessation of work. All project operations, except efforts to minimize storm or high flow

erosion, will cease under high flow conditions that may result in inundation of the project area.

i. The additional project related conservation measures as proposed in the Programmatic BA are required elements of any project except as modified by these terms and conditions.

j. Integrated Streambank Protection Guidelines (ISPG). Projects proposing to use bank stabilization at crossing structures, revegetate at streambank grading sites, place stream bed controls or otherwise impact the natural erosional patterns of the stream shall incorporate, and demonstrate in a written description, the site design fundamentals of WDFW's ISPG available for review and download at: *http://www.wa.gov/wdfw/hab/ahg/ispgdoc.htm*

k. NMFS will have 30 days to review the replacement of tide gates which are designed to enhance fish passage.* Review of proposed projects will include relative improvement from baseline conditions. Projects will be designed to maximize the time adult and juvenile fish are able to traverse through the structure throughout the tidal cycle and/or river stage while maintaining flood control intent. Some projects may be able to further enhance passage in critical times of the year (i.e. periods of adult migration and juvenile outmigration/rearing).

(* Projects that document to the COE that passage can occur through 90% of the tide cycle or 90% of river stage in non-tidal areas, and that provide adequate salinity to those areas that fish will have access to, do not require 30 day review period.)

2. Pre-construction activities. Before significant alteration of the action area occurs, the following actions will be accomplished.

a. Boundaries of the clearing limits associated with site access and construction are flagged to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

b. The following erosion control materials are onsite.

i. a supply of erosion control materials (e.g., silt fence and straw bales) is on hand to respond to sediment emergencies. Sterile straw or hay bales will be used when available to prevent introduction of weeds.
ii. an oil absorbing, floating boom is available on-site during all phases of construction whenever surface water is present.

c. All temporary erosion controls (e.g., straw bales, silt fences) are in-place and appropriately installed downslope of project activities within the riparian area. Effective erosion control measures will be in-place at all times during the contract, and will remain and be maintained until such time that permanent erosion control measures are effective.

3. Heavy Equipment. Heavy equipment use will be restricted as follows.

    a. When heavy equipment is required, the applicant will use equipment having the least impact necessary to accomplish the authorized work (e.g. low ground pressure, minimally sized, rubber tired).

    b. Heavy equipment will be fueled, maintained and stored as follows.

        i. all equipment that is used for instream work will be cleaned prior to operations below the bankfull elevation. External oil and grease will be removed, along with dirt and mud. No untreated wash and rinse water will be discharged into streams and rivers without adequate treatment.
        ii. place vehicle staging, maintenance, refueling, and fuel storage areas a minimum of 150 feet horizontal distance from any stream.
        iii. all vehicles operated within 150 feet of any stream or water body will be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected will be repaired before the vehicle resumes operation.
        iv. when not in use, vehicles will be stored in the vehicle staging area.
        v. oil-absorbent pads and personnel trained in spill prevention and control will be present during equipment operations.

4. Site preparation. Site preparation is completed in the following manner, including removal of stream materials, topsoil, surface vegetation and major root systems.

    a. Any instream large wood or riparian vegetation that is moved or altered during construction will stay on site or be replaced with a functional equivalent.

    b. Clearing and grubbing will not exceed .25 acre within 150 feet of any stream occupied by listed salmonids during any part of the year, or within 50 feet of any stream not occupied by listed salmonids.

    c. Tree removal will be strictly limited.

        i. all perennial and intermittent streams: No tree 6 inches diameter at breast height (dbh) or greater will be removed from within 50 feet horizontal distance of the ordinary high water mark.
        ii. on any stream supporting a listed salmonid: No more than 5 trees 6 inches dbh or greater total may be removed from the area spanning 50 feet to 150 feet horizontal distance from the ordinary high water mark.
        iii. all tree removal will be mitigated for onsite by a 2:1 replanting ratio.
        iv. whenever the project area is to be revegetated or restored, native channel material, topsoil and native vegetation removed for the project should be stockpiled for redistribution on the project area.

5. Earthwork. Earthwork, including drilling, blasting, excavation, dredging, filling and

compacting, is completed in the following manner:

a. Boulders, rock, woody materials and other natural construction materials used for the project must be obtained from outside of the riparian area.

b. Conservation measure (j) of the BA references bank stabilization limited to the existing road fill prism. It is clarified that the intended use of bank stabilization materials is to protect the road prism only at the inverts of crossing structures when required for the preservation of the structure.

c. During excavation, native streambed materials will be stockpiled above the bankfull elevation for later use. If invert protecting rip rap has been placed, native materials will be placed over the top of the rip rap.

d. Streambed grading associated with debris jam or sediment terrace removal projects will occur only when needed to facilitate fish passage and shall be supported by the co-managers with documentation included in the project proposal. When streambed aggregate is to be graded and does not consist of fines (< .85mm) the aggregate shall not be removed from the stream channel.

e. Stream bank grading shall be the minimum necessary to revegetate and restore bank lines disturbed in the course of conducting the project activity.

f. Material removed during excavation will only be placed in locations where it cannot enter streams or other water bodies.

g. To minimize the duration of area exposed, projects will be completed as quickly as possible without compromising the quality of work and disturbed areas shall be stabilized within 3 days of the end of construction.

    i. temporary and permanent cover measures shall be provided to protect disturbed areas (e.g. erosion control and blankets, plastic covering, mulching, seeding[8], or sodding). Temporary cover shall be installed if any cleared or graded area is to remain un-worked for more than seven days from June 1- Sept. 30; and for more than two days from Oct. 1 - may 31. Temporary cover shall be completed within 12 hours of cessation of work in areas that will remain un-worked for the specified time periods. As long as the covering remains in place, planting or seeding is not required in covered areas until conditions are appropriate for growth.
    ii. all disturbed areas will be re-planted with native vegetation within three days of the end of construction, unless covered or otherwise stabilized with appropriate erosion and sediment control measures. Planting shall be completed no later than April 15 of

[8] By Executive Order 13112 (February 3, 1999), Federal agencies are not authorized to permit, fund or carry out actions that are likely to cause, or promote, the introduction or spread of invasive species. Therefore, only native vegetation that is indigenous to the project vicinity, or the region of the state where the project is located, shall be used.

the year following construction.

h. All erosion control devices will be inspected during construction to ensure that they are working adequately.

   i. erosion control devices will be inspected daily during the rainy season, weekly during the dry season, monthly on inactive sites.
   ii. if inspection shows that the erosion controls are ineffective, work crews will be mobilized immediately, during working and off-hours, to make repairs, install replacements, or install additional controls as necessary.
   iii. erosion control measures will be judged ineffective when turbidity plumes resulting from proposed activities are evident in waters occupied by listed salmonids during any part of the year.

i. If soil erosion and sediment resulting from construction activities is not effectively controlled, the engineer will limit the amount of disturbed area to that which can be adequately controlled.

j. Sediment will be removed from sediment controls once it has reached 1/3 of the exposed height of the control. Whenever straw bales are used, they will be staked and dug into the ground 5 inches (12 cm). Catch basins will be maintained so that no more than 6 inches (15 cm) of sediment depth accumulates within traps or sumps.

k. Sediment-laden water created by construction activity will be filtered before it leaves the right-of-way or enters a stream or other water body. Silt fences or other detention methods will be installed as close as reasonable to culvert outlets to reduce the amount of sediment entering aquatic systems.

6. Site restoration. Site restoration and clean-up, including protection of bare earth by seeding, planting, mulching and fertilizing, is done in the following manner.

   a. All damaged areas will be restored to pre-work conditions including restoration of original stream bank lines, and contours.

   b. All exposed soil surfaces, including construction access roads and associated staging areas, will be stabilized at finished grade with mulch, native herbaceous seeding prior to October 1. (Native woody vegetation will be planted prior to April 15) On cut slopes steeper than 1v:2h, a tackified seed mulch will be used so that the seed does not wash away before germination and rooting occurs. In steep locations, 1v:2h a hydro-mulch will be applied at 1.5 times the normal rate.

   c. Disturbed areas will be planted with native vegetation specific to the project vicinity or the region of the state where the project is located, and will comprise a diverse assemblage of woody and herbaceous species.

d. Plantings will be arranged randomly within the revegetation area.

e. All plantings will be completed before April 15.

f. No herbicide application will occur within 300 feet of any stream channel as part of this permitted action. Mechanical removal of undesired vegetation and root nodes is permitted.

g. No surface application of fertilizer will be used within 50 feet of any stream channel as part of this permitted action.

h. Fencing will be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.
   i. plantings will achieve an 80 percent survival success after three years.
   ii. if success standard has not been achieved after 3 years, the applicant will submit an alternative plan to the COE. The alternative plan will address temporal loss of function.
   iii plant establishment monitoring will continue and plans will be submitted to the COE until site restoration success has been achieved.

7. Monitoring for Fish Passage Conditions. Monitoring for Fish Passage Conditions: Culvert replacements and modifications will be monitored by qualified personnel for passage of the target fish species and life history stage during summer, high (greater than or equal to the 5-year flow event) and bankfull discharge or for six years, whichever is sooner. Monitoring shall document the hydraulic conditions (depth; velocity; elevation drop at inlet, outlet, and within the culvert/under the bridge) around and through the structure at each of the stated flow thresholds. In the event that the project does not meet the duration, velocity, flow, depth, and elevation drop standards to allow passage of the target fish species and life history stage, the permittee shall implement corrective actions necessary to allow fish passage of the target species at the project site.

B. Project Reporting: Protective coverage of this incidental take statement is only applied to proposed actions within the categories of activities considered by this Opinion and limited by these terms and conditions.

1. Project reporting shall contain the following information:

a. Isolation of in-water work area. All projects involving isolation of in-water work areas must include a report of any seine, electroshocking, and release activity including:
   i. The name and address of the supervisory fish biologist;
   ii. methods used to isolate the work area and minimize disturbances to ESA-listed species;
   iii. stream conditions prior to and following placement and removal of barriers;
   iv. the means of fish removal;
   v. the number of fish removed by species;

vi. the location and condition of all fish released;
vii. any incidence of observed injury or mortality; and
viii. starting and ending dates for work performed under the permit.

b. Pollution and erosion control. Copies of all pollution and erosion control inspection reports, including descriptions of any failures experienced with erosion control measures, efforts made to correct them and a description of any accidental spills of hazardous materials.

c. Site restoration. Documentation of the following conditions:

i. Finished grade slopes and elevations.
ii. Log and rock structure elevations, orientation, and anchoring, if any.
iii. Planting composition and density.
iv. A plan to inspect and, if necessary, replace failed plantings and structures for a period of five years.

d. A narrative assessment of the project's effects on natural stream function.

e. Photographic documentation of environmental conditions at the project site and compensatory mitigation site(s) (if any) before, during and after project completion.

i. Photographs will include general project location views and close-ups showing details of the project area and project, including pre and post construction.
ii. Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.
iii. Relevant habitat conditions include characteristics of channels, streambanks, riparian vegetation, flows, water quality, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

2. Annual monitoring report. By January 31 of each year, the COE will provide the NMFS with an annual monitoring report that describes the COE's achievements carrying out this Opinion through the permitting program for the categories of activities. This report will summarize project identification data, with special attention to projects featuring erosion control, stream crossings, streambed grading, tide gates, and provide an assessment of program activities.

a. Project level data for all permits issued under this Opinion will be summarized in an electronic spread sheet containing the following information:
i. Permit number;
ii. applicant's name;
iii. project name;
iv. category of activity under which the permit was issued;
v. location by 5th field hydrological unit code (HUC), river mile and latlong; and
vi. the COE contact person.

b. The NMFS is particularly interested in an accounting of projects that required a supporting analysis, i.e., erosion control, road crossings, streambed grading, temporary road construction, discharge and excavations activities. For those projects, provide a summary of supporting analyses by 5th field HUC in a separate part of the monitoring report.

c. In addition to project level data, the monitoring report will include an overall assessment of all COE permitting activities by categories of action considered in this Opinion during the previous year, including an evaluation of:

   i. the number of projects authorized by the programmatic;
   ii. the quality of supporting analyses required for individual actions involving erosion control, stream crossings, debris jam removal, temporary road construction;
   iii. the quality of monitoring information provided by permittees;
   iv. the quantity and quality of compensatory mitigation completed by permittees;
   v. trends in the environmental baseline by 5th HUC as a result of activities permitted under this Opinion; and
   vi. recommendations to improve the effectiveness of the program.

d. The annual report will be submitted to:

   Branch Chief - Washington Branch
   National Marine Fisheries Service
   Attn: WSB-01-197
   510 Desmond Dr. SE
   Lacey, WA 98503

3. The COE will meet with NMFS by March 31 each year to discuss the monitoring report and any actions that may be necessary to make the program more effective.

4. The COE will reinitiate formal consultation on the categories of actions authorized by this Opinion within three years of the date of issuance. This term and condition is in addition to reinitiation requirements described in section VI, above.

VIII. CONSERVATION RECOMMENDATIONS

Section 7 (a)(1) of the ESA directs Federal agencies to use 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, to minimize or avoid adverse modification of critical habitats, or to develop additional information. NMFS believes the following conservation recommendations are consistent with these obligations, and therefore should be carried out by the COE:

1. To the greatest extent possible, the COE should develop a database that consists of all existing permits that have resulted in projects in these categories (and the categories of subsequent phases of this programmatic document). The database should be compatible with monitoring information that will be produced to meet the requirements of this Opinion. Thus each project entered into the database should be identified by 5th field hydrological unit code (HUC), and contain, where possible, the following information: 1) Permit number; 2) applicant name; 3) project name; 4) the category of activity under which the permit was issued; 5) location by river mile and latlong; 5) starting and ending dates for work done under the permit; and 6) the COE contact person. The COE should also ensure that this data base is compatible with the Northwest Forest Plan and/or SSHIAP data bases as are currently in use.

2. The COE should also develop another database, compatible with monitoring data that will be collected under this Opinion and with the database described in conservation recommendation #1, above, consisting of all permits the COE has issued, and will issue in the future, for categories of activities that are not included in this consultation. The COE should also ensure that this data base is compatible with the Northwest Forest Plan and/or SSHIAP data bases as are currently in use.

3. The COE should invite tribal participation in the annual reviews of projects authorized by this programmatic consultation.

NMFS believes this information will help to reduce uncertainty about the effects of past and ongoing human and natural factors leading to the status of listed salmon and steelhead, their habitats, and the aquatic ecosystem within the Seattle District of the COE.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed salmon and steelhead or their habitats, NMFS requests notification of the achievement of any conservation recommendations when the COE submits its annual report describing achievements of the permitting process for the activities during the previous year.

IX. ESSENTIAL FISH HABITAT CONSULTATION

A. Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS shall provide conservation recommendations for any Federal or State activity that may adversely affect EFH (§305(b)(4)(A));

- Federal agencies shall within 30 days after receiving conservation recommendations from NMFS provide a detailed response in writing to NMFS regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NMFS, the Federal agency shall explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: 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 (50 CFR 600.110). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

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 NMFS is required by Federal agencies regarding any activity that may adversely affect EFH, regardless of its location.

The objective of this Essential Fish Habitat (EFH) consultation is to determine whether the proposed action may adversely affect designated EFH, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse impacts to EFH resulting from the proposed action.

B. 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 NMFS 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 impacts to these species' EFH from the proposed action is based, in part, on this information.

C. Proposed Actions

The proposed action and action area are detailed above in Sections I and II of this Opinion. The action area includes habitats that have been designated as EFH for various life-history stages of 48 species of groundfish, five coastal pelagic species, and three species of Pacific salmon (Table 1).

D. Effects of Proposed Action

As described in detail in Section IV of this Opinion, the proposed actions may result in detrimental short- and long-term impacts to a variety of habitat parameters. These adverse effects include:

1. Short-term increases in suspended sediment and turbidity;

2. Compaction and disturbance of instream gravel from heavy equipment;

3. Disturbance of the riparian habitat may result in loss of LWD recruitment, loss of shade and cover (increased water temperatures), loss of habitat complexity and decreased floodplain interactions;

4. Delivery of toxic or harmful substances into the waterway; and

5. Increased peak flows and reduced summer flows in rivers and streams due to the channelization of surface and shallow sub-surface flows;

E. Conclusion

NMFS believes that the proposed action may adversely impact the EFH for the groundfish, coastal pelagic, and Pacific salmon species listed in Table 1.

F. EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NMFS is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. While NMFS assumes that the conservation measures described in the BO will be implemented by the COE, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. However, the Reasonable and Prudent Measures and the Terms and Conditions outlined in Section VII are generally applicable to designated EFH for the species listed in Table 1 and address these adverse effects. Consequently, NMFS recommends that they be adopted as EFH conservation measures. If implemented by the COE, these measures will minimize the potential adverse impacts of the proposed project and conserve EFH.

G. Statutory Response Requirement

Please note that the MSA and 50 CFR 600.920(j) require the Federal agency to provide a written response to NMFS' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity. In the case of a response that is inconsistent with the EFH Conservation Recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

H. Supplemental Consultation

The COE must reinitiate EFH consultation with NMFS if any of the proposed actions are substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600.920(k)).

Table 1. Species of fishes with designated EFH that may occur in the project areas. Taken from Casillas, et al., 1998, PFMC 1998b, PFMC 1999.

Groundfish Species	darkblotched rockfish *S. crameri*	curlfin Sole *Pleuronichthys decurrens*
soupfin shark *Galeorhinus galeus*	greenspotted rockfish *S. chlorostictus*	dover Sole *Microstomus pacificus*
spiny dogfish *Squalus acanthias*	greenstriped rockfish *S. elongatus*	English Sole *Parophrys vetulus*
big skate *Raja binoculata*	Pacific Ocean perch *S. alutus*	flathead Sole *Hippoglossoides elassodon*
California skate *R. inornata*	quillback rockfish *S. maliger*	Pacific sanddab *Citharichthys sordidus*
longnose skate *R. rhina*	redbanded rockfish *S. babcocki*	petrale sole *Eopsetta jordani*
ratfish	rosethorn rockfish	rex sole

Hydrolagus colliei	*S. helvomaculatus*	*Glyptocephalus zachirus*
Pacific rattail *Coryphaenoides acrolepis*	rougheye rockfish *S. aleutianus*	rock sole *Lepidopsetta bilineata*
lingcod *Ophiodon elongatus*	sharpchin rockfish *S. zacentrus*	sand sole *Psettichthys melanostictus*
cabezon *Scorpaenichthys marmoratus*	shortbelly rockfish *S. jordani*	starry flounder *Platichthys stellatus*
kelp greenling *Hexagrammos decagrammus*	shortraker rockfish *S. borealis*	**Coastal Pelagic Species**
Pacific cod *Gadus macrocephalus*	shortspine thornyhead *Sebastolobus alascanus*	northern anchovy *Engraulis mordax*
Pacific whiting (hake) *Merluccius productus*	silverygray rockfish *Sebastes brevispinis*	Pacific sardine *Sardinops sagax*
sablefish *Anoplopoma fimbria*	splitnose rockfish *S. diploproa*	Pacific (chub) mackeral *Scomber japonicus*
aurora rockfish *Sebastes aurora*	stripetail rockfish *S. saxicola*	jack mackeral *Trachurus symmetricus*
blue rockfish *S. mystinus*	vermilion rockfish *S. miniatus*	market squid *Loligo opalescens*
bocaccio *S. paucispinis*	widow rockfish *S. entomelas*	**Pacific Salmon Species**
brown rockfish *S. auriculatus*	yellowtail rockfish *S. flavidus*	chinook salmon *Oncorhynchus tshawytscha*
chilipepper *S. goodei*	arrowtooth Flounder *Atheresthes stomias*	coho salmon *O. kisutch*
copper rockfish *S. caurinus*	butter Sole *Isopsetta isolepis*	Puget Sound pink salmon *O. gorbuscha*

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APPENDIX A
TIERED REVIEW PROCESS

APPENDIX B
WDFW WORK WINDOWS

TABLE 1. ALLOWABLE ~~IN-WATER~~ WORK WINDOWS FOR HYDRAULIC PROJECTS

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season [1] by County		*Exceptions to General Season [2]*		
County / Watershed	*Activity Is Allowed Only Between These Dates*	*Stream and All Tributaries, Unless Otherwise Listed [2]*	*Activity Is Allowed Only Between These Dates*	*Species Protected [4]*
Adams	July 1- October 31	Esquatzel Creek (36.MISC) Palouse River (34.0003)	July 1 - September 30 June 15 - October 15	
Asotin	July 15 - ~~October 31~~ September 30 [5]	Asotin Creek (35.1716) Grande Ronde River (35.2192)	July 15 - August ~~15~~ 31 July 15 - August ~~15~~ 31	BT, CHSP, ST (didn't designate winter or summer) BT, CHF, CHSP, ST
Benton	June 1 - September 30	Yakima River (37.0002) - Corral Creek (37.0205) - Spring Creek (37.1384)	July 1 - September 30 July 15 - September 30 July 15 - September 30	
Chelan	July 1 - August 15	Chelan River (47.0052) - mouth to Chelan Gorge Colockum Creek (40.0760) Entiat River (46.0042) - below McKenzie Irrigation Dam - Mad River (46.0125) Entiat River (46.0042) - above McKenzie Irrigation Dam Lake Wenatchee (45.0030) - Little Wenatchee River (45.0985) - White River (45.1116) Squilchuck Creek (40.0836) Stemilt Creek (40.0808) - mouth to falls Wenatchee River (45.0030) - mouth to ~~upper Tumwater Canyon bridge (SR2)~~ Chiwaukum Creek - Chumstick Creek (45.0402) - Icicle Creek (45.0474) - Mission Creek (45.0089) - Peshastin Creek (45.0232) - mouth to Negro Creek (45.0323) - Peshastin Creek (45.0232) - above Negro Creek (45.0323) Wenatchee River (45.0030) - ~~upper Tumwater Canyon Bridge~~ Chiwaucum Creek to Wenatchee lake - Beaver Creek (45.0751) - Chiwaeukum Creek (45. 0700) - Chiwawa River (45.0759) - Nason Creek (45.0888)	July 1 - September 30 July 1 - October 31 July 1 - September 30 July 1 - August 15 July 1 - August 15 July 1 - September 30 July 1 - August 15 July 1 - August 15 July 1 - October 31 July 1 - October 31 July 1 - September 30 July 1 - August 15 July 1 - August 15 July 1 - August 15 July 1 - August 15 July 1 - October 31 July 1 - August 15 July 1 - October 31 July 1 - August 15 July 1 - August 15 July 1 - August 15	 CHS, CHSP, ST CHSP, ST BT

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season [1] by County		Exceptions to General Season [2]		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed [2]	Activity Is Allowed Only Between These Dates	Species Protected [4]
Clallam	July 15 - September 30	Bogachiel River (20.0162) Calawah River (20.0175) Clallum River (19.0129) Dungeness River (18.0018) Elwha River (18.0272) - mouth to lower dam Hoko River (19.0148) Jimmycomelately Creek (17.0285) Lyre River (19.0031) McDonald Creek (18.0160) Morse Creek (18.0185) Pysht River (19.0113) Sekiu River (19.0203) Sol Duc River (20.0096) Sooes River (20.0015) Lake Ozette (20.0046) Lake Pleasant (20.0313)	July 15 - August 15 July 15 - August 15 July 15 - September 15 July 15 - September 15 July 1 - August 15 July 15 - September 15 July 15 - September 15 July 15 - September 15 July 1 - August 15 July 1 - August 15 July 15 - September 15 July 15 - September 15 July 15 - August 15 July 15 - September 15 May 1 - September 30 May 1 - September 30	
Clark	July 1 - September 30	Lewis River (27.0168) - mouth to East Fork Lewis River ~~forks~~ - East Fork Lewis River (27.0173) - mouth to Sunset Falls ~~LaCenter Road bridge~~ - Copper Creek (27.0275) - East Fork Lewis River (27.0173)-above Sunset Falls ~~LaCenter~~ - North Fork Lewis River (27.0168) - ~~mouth~~ confluence with East Fork Lewis River to Merwin Dam - Cedar Creek - North Fork Lewis River (27.0168) - Merwin Dam to Lower Falls ~~Swift Dam~~ Lake River (28.0020) Washougal River (28.0159)	June 1 - October 31 July 15 - September 30 ~~July 1 - October 31~~ July 15 - October 31 July 15 - October 31 ~~- August 31~~ August 1 - August 31 August 1 - September 30 July 1 - July 31 July 1 - September 30 ~~June 1 - October 31~~ August 1 - August 31	
Columbia	July 15 - ~~October 31~~ September 30 [5]	Tucannon River (325.0009) - mouth to Marengo bridge Tucannon River (35.0009) - Marengo bridge to Tumalum Creek (35.0368) Tucannon River (35.0009) - above Tumalum Creek (35.0368) Touchet River (32.0097) - mouth to Wolf Fork (32.0773) Touchet River (32.0097) - above Wolf Fork (32.0773)	July 15 - ~~August~~ September 15 July 15 - August 31 July 15 - August 15 July 15 - ~~August 15~~ September 30 July 15 - August 20	CHF, ST CHSP, ST BT, CHSP, ST BT, ST BT, ST

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season [1] by County		Exceptions to General Season [2]		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed [2]	Activity Is Allowed Only Between These Dates	Species Protected [4]
Cowlitz	July 1 - September 30	Cowlitz River (26.0002) - Coweeman River (26.0003) - Toutle River (26.0227) Kalama River (27.0002) Lewis River (27.0168) - mouth to East Fork Lewis River ~~forks~~ - North Fork Lewis River (27.0168) - confluence with East Fork Lewis River ~~mouth~~ to Merwin Dam - North Fork Lewis River (27.0168) - Merwin Dam to Lower Falls - North Fork Lewis River (27.0168) - above Lower Falls	August 1 - August 31 August 1 - September 30 July 1 - September 15 August 1 - August 31 June 1 - October 31 August 1 - August 31 July 1 - July 31 July 1 - October 31	
Douglas	July 1 - October 31	None		
Ferry	July 1 - August 31	Lakes	March 15 - May 10 and July 1 - September 30	
Franklin	June 1 - September 30	Palouse River (34.0003) - above falls	June 15 - October 15	
Garfield	July 15 - ~~October 31~~ September 30 [5]	Asotin Creek (35.1716) Tucannon River (35.0009)	July 15 - August 15 July 15 - August 15	BT, ST BT, ST
Grant	July 1 - October 31	None		
Grays Harbor	July 15 - October ~~31~~ 15	Chehalis River (22.0190/23.0190) - mouth to Porter Creek - Cloquallum River (22.0501) - Satsop River (22.0360) Chehalis River (22.0190/23.0190) - above Porter Creek - Cedar Creek (23.0570) - Porter Creek (23.0543) Elk River (22.1333) Johns River (22.1270) North River (24.0034) Quinault River (21.0398)	June 1 - October ~~31~~ 15 July 15 - September 30 July 15 - August 31 July 15 - September 30 July 15 - September 30 July 15 - September 30 July 15 - September 30 July 15 - September 30 July 15 - September 15 July 15 - August 31	CHS
Island	June 15 - September 15	None		

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season [1] by County		Exceptions to General Season [2]		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed [2]	Activity Is Allowed Only Between These Dates	Species Protected [4]
Jefferson	July 15 - October 31	Big Quilcene River (17.0012) Bogachiel River (20.0162) Chimacum Creek (17.0203) Donovan Creek (17.0115) Dosewallips River (16.0442) Duckabush River (16.0351) Dungeness River tributaries (18.0018) Hoh River (20.0422) Little Quilcene River (17.0076) Queets River Quinault River (21.0398) Salmon Creek (17.0245) Snow Creek (17.0219)	July 15 - August 31 July 15 - August 15 July 15 - August 31 July 15 - September 30 July 15 - August 31 July 15 - August 31 July 15 - August 31 July 15 - August 15 July 15 - August 31 July 15 - September 15 July 15 - August 15 July 15 - August 15 July 15 - August 15	
King	July 1 - September 30	Green River (Duwamish River) (09.0001) Lake Sammamish (08.0057) Lake Washington (08.LKWA) - Ship canal, Portage Bay, and Lake Union (08.0028) All Lake Washington tributaries, except - Issaquah Creek (08.0178) Snoqualmie River (07.0219) - mouth to Snoqualmie Falls - Raging River (07.0384) - Patterson Creek (07.0376) Snoqualmie River (07.0219) - Snoqualmie Falls to mouth of South Fork Snoqualmie River - North Fork Snoqualmie River (07.0527) - Middle Fork Snoqualmie River (07.0219) - South Fork Snoqualmie River (07.0467) South Fork Skykomish River (07.0012) - mouth to Sunset Falls South Fork Skykomish River (07.0012) - Sunset Falls to Alpine Falls South Fork Skykomish River (07.0012) - above Alpine Falls - Beckler River (07.1413) - mouth to Boulder Creek - Foss River (07.1562) - mouth to forks - East Fork Foss River (07.1562) - West Fork Foss River (07.1573) - Miller River (07.1329) - mouth to forks - Miller River (07.1329) - above forks Tolt River (07.0291) - mouth to forks - North Fork Tolt River (07.0291) - mouth to Yellow Creek - North Fork Tolt River (07.0291) - above Yellow Creek - South Fork Tolt River (07.0302) - mouth to dam - South Fork Tolt River (07.0302) - above dam White River (10.0031)	August 1 - August 31 ~~July 1 - August 15~~ June 16 - October 31 ~~July 1 - August 15~~ June 16 - October 31 July 1 - March 31 July 1 - August 31 June 15 - July 31 July 1 - September 15 July 15 - August 31 June 15 - September 30 June 15 - October 31 July 15 - October 31 July 15 - October 31 July 15 - October 31 July 1 - August 31 July 1 - September 15 July 15 - October 31 July 1 - September 15 July 15 - September 15 July 15 - September 30 July 15 - October 31 July 1 - September 15 July 1 - October 31 July 15 - October 31 July 15 - September 15 July 15 - October 31 July 15 - September 15 July 15 - October 31 July 15 - August 31	CH, CO, SO, ST CH, CO, SO, ST CH, CO, SO, ST CH, CO, SO, ST CH, CO, SO, ST CH, CO, ST CO, ST

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season [1] by County		Exceptions to General Season [2]		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed [2]	Activity Is Allowed Only Between These Dates	Species Protected [4]
Kittitas	June 1 - September 30	Colockum Creek (40.0760) Yakima River (39.0002) - Roza Dam to Teanaway River - Teanaway River (39.1236) Yakima River (39.0002) - above Teanaway River - Gold Creek (Lake Keechelus) (39.1842) - Kachess River (39.1739) - above Lake Kachess - Box Canyon Creek (Lake Kachess) (39.1765) - Little Naches River (38.0852) - Wenas Creek (39.0032) - Other Yakima River tributaries	July 1 - October 31 July 1 - August 31 August 1 - August 31 August 1 - August 31 July 1 - July 31 July 1 - July 31 July 1 - July 31 July 15 - August 15 August 1 - October 31 July 15 - August 31	
Kitsap	July 15 - October 31	Seabeck Creek (15.0400) Gorst Creek (15.0216)	July 15 - August 31 July 15 - August 31	
Klickitat	June 15 - September 30	Klickitat River (30.0002) - mouth to Klickitat hatchery Klickitat River (30.0002) - above Klickitat hatchery White Salmon River (29.0160)	June 15 - August 15 June 15 - August 1 June 15 - August 15	CHSP CHSP
Lewis	July 1 - September 30	Chehalis River (22.0190/23.0190) - upstream of South Fork Chehalis River confluence - Newaukum River (23.0882) - Skookumchuck River (23.0761) Cowlitz River (26.0002) - Cispus River (26.0668) - mouth to Walupt Creek - Yellowjacket Creek (26.0757) - McCoy Creek (26.0766) - mouth to lower falls - McCoy Creek (26.0766) - above lower falls - Cispus River (26.0668) - above Walupt Creek - Walupt Creek (26.1010) - Tilton River (26.0560) - Packwood Lake tributaries Nisqually River (11.0008) - above Alder Lake Toutle River (26.0227)	July 1 - August 31 July 1 - August 31 July 1 - August 31 August 1 - August 31 August 1 - August 31 August 1 - September 30 August 1 - September 30 August 1 - October 31 July 15 - September 30 July 30 - September 30 August 1 - September 30 July 30 - September 30 July 1 - September 30 July 1 - September 15	CHSP CHSP CHSP
Lincoln	June 15 - October 15	None		

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season [1] by County		Exceptions to General Season [2]		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed [2]	Activity Is Allowed Only Between These Dates	Species Protected [4]
Mason	July 15 - October 31	Cloquallum Creek (22.0501) Coulter Creek (15.0002) Hamma Hamma River (16.0251) - mouth to falls - John Creek (16.0253) Johns Creek (14.0049) Lilliwaup River (16.0230) - below falls Lilliwaup River (16.0230) - above falls Mill Creek (14.0029) Satsop River (22.0360) Schaerer Creek (16.0326) Sherwood Creek (14.0094) Skokomish River (16.0001) Tahuya River (15.0446) Twanoh Creek (14.0134) Union River (15.0503)	July 15 - September 30 July 15 - September 15 July 15 - August 31 July 15 - August 31 July 15 - August 31 July 15 - August 31 July 1 - October 31 July 15 - October 15 July 15 - August 31 July 15 - August 31 July 15 - September 15 July 15 - September 15 July 15 - September 15 June 15- October 31 June 15- September 15	CHS
Okanogan	July 1 - August 15	Aneas Creek (49.0243) - mouth to falls Chewiliken Creek (49.0232) - mouth to falls Chiliwist Creek (49.0034) - mouth to falls Methow River (48.0007) - mouth to Carleton Mosquito Creek (49.0321) Nine Mile Creek (49.0516) Omak Creek (49.0138) - mouth to falls Similkameen River (49.0325) - mainstem - Similkameen River (49.0325) tributaries Tunk Creek (49.0211) - mouth to falls Lake Osooyos (49.0019)	July 1 - October 31 July 1 - October 31 July 1 - October 31 July 1 - September 30 July 1 - October 31 July 1 - October 31 July 1 - October 31 July 1 - September 30 July 1 - August 15 July 1 - October 31 July 1 - September 30	
Pacific	July 15 - September 30	Chehalis River (22.0190/23.0190) Chinook River (24.MISC) Grays River (25.0093) Naselle River (24.0543) North River (24.0034)	July 1 - August 31 August 1 - August 31 August 1 - September 30 July 1 - August 31 July 15 - September 15	CHSP CHF
Pend Oreille	July 1 - August 31	Big Muddy Creek (62.0279) Bracket Creek (62.0815) Calispel Creek (62.0628) - mouth to Calispel Lake Exposure Creek (62.0261) Kent Creek (62.0819) Lime Creek (62.0014) Little Spokane River (55.0003) Lodge Creek (62.0859) Marshall Creek (62.0842) Pee Wee Creek (62.0007) - above falls Renshaw Creek (62.0310) Lakes	June 1 - August 31 June 1 - August 31 June 1 - August 31 June 1 - August 31 June 1 - August 31 June 1 - August 31 June 15 - August 31 June 1 - August 31 June 1 - August 31 June 1 - October 31 June 1 - August 31 March 15 - May 10 and July 1 - September 30	

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season [1] by County		Exceptions to General Season [2]		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed [2]	Activity Is Allowed Only Between These Dates	Species Protected [4]
Pierce	July 15 - August 31	Nisqually River (11.0008) - mouth to Alder Lake - tributaries below Alder Lake Nisqually River (11.0008) - above Alder Lake and tributaries Carbon River (10.0413) - South Prairie Creek (10.0429) - mouth to Forest Service road #7710 - South Prairie Creek (10.0429) - above Forest Service road #7710 - Wilkeson Creek (10.0432) - mouth to Snell Lake - Wilkeson Creek (10.0432) - above Snell Lake - Voight Creek (10.0414) - mouth to falls - Voight Creek (10.0414) - above falls Rocky Creek (15.0015)	July 1 - August 31 July 1 - September 15 July 15 - September 15 July 15 - August 31 July 15 - September 15 July 1 - October 31 July 1 - September 30 July 1 - October 31 July 15 - September 15 July 15 - October 31 July 15 - September 30	
San Juan	June 1 - August 31	None		
Skagit	July 1 - September 30	Baker River (04.0435) - mouth to dam Samish River (03.005) - below hatchery rack Samish River (03.005) - above hatchery rack Skagit River (03.0176/04.0176) - mouth to Sauk River (04.0673) Skagit River (03.0176/04.0176) - ~~above~~ Sauk River to Newhalem Creek (04.1902) - Cascade River (04.1411) - Illabot Creek (04.1346) - Sauk River (04.0673) - Suiattle River (04.0710) Skagit River (03.0176/04.0176) - above Newhalem Creek (04.1902) Nooksack River (01.0120) - South Fork Nooksack River (01.0246)	June 15 - July 31 June 15 - August 15 June 15 - September 30 June 15 - August 31 ~~June 15 - July 31~~ July 15 - July 31 ~~June 15 - July 15~~ Site specific ~~June 15 - July 31~~ July 15 - July 31 July 15 - August 15 July 15 - August 15 June 15 - July 31 June 15 - August 15 July 15 - August 15	 STW; T STW; T STW; T BT; T; STS STS, T
Skamania	July 1 - September 30	Cispus River (26.0668) - Yellowjacket Creek (26.0757) - McCoy Creek (26.0766) - mouth to lower falls - McCoy Creek (26.0766) - above lower falls East Fork Lewis River (27.0173) - below Sunset Falls - Copper Creek (27.0275) East Fork Lewis River (27.0173) - above Sunset Falls North Fork Lewis River (27.0168) - Merwin Dam to Lower Falls ~~- Cougar Creek (27.0479)~~ North Fork Lewis River (27.0168) - above Lower Falls Little White Salmon River (29.0131) Washougal River (28.0159) White Salmon River (29.0160) Wind River (29.0023)	August 1 - August 31 August 1 - September 30 August 1 - September 30 August 1 - October 31 July 15 - September 30 ~~August 31~~ July 15 - October 31 July 15 - October 31 July 1 - July 31 ~~July 1 - July 31~~ July 15 - October 31 July 1 - August 31 August 1 - August 31 July 1 - August 31 August 1 - August 15	

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season [1] by County		Exceptions to General Season [2]		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed [2]	Activity Is Allowed Only Between These Dates	Species Protected [4]
Snohomish	July 1 - September 30	All Lake Washington tributaries	July 1 - August 31	
		Sauk River (04.0673)	July 15 - August 15	
		- Suiattle River	July 15 - August 15	
		Snohomish River (07.0012) - mouth to Highway 9	June 1 - October 31	
		Snohomish River (07.0012) - above Highway 9	July 1 - August 31	
		- Pilchuck River (07.0125) - mouth to city of Snohomish diversion dam	July 1 - August 31	
		- Pilchuck River (07.0125) - above city of Snohomish diversion dam	July 1 - September 15	
		- Skykomish River (07.0012) - mouth to forks	July 15 - August 31	STW
		- North Fork Skykomish River (07.0982) - mouth to ~~San Juan campground~~ Bear Creek Falls	July 15 - August 31	STW
		- North Fork Skykomish River (07.0982) - ~~San Juan campground~~ Bear Creek Falls to Deer Falls	July 15 - August 15	CHS
		- North Fork Skykomish River (07.0982) - above Deer Falls	July 15 - October 31	
		- Salmon Creek (07.1031)	July 15 - September 30	Char (BT??)
		- South Fork Skykomish River (07.0012) - mouth to Sunset Falls	July 15 - August 31	STW
		- South Fork Skykomish River (07.0012) - Sunset Falls to Alpine Falls	July 1 - ~~September 15~~ August 31	CHS
		- South Fork Skykomish River (07.0012) - above Alpine Falls	July 15 - October 31	
		- Beckler River (07.1413) - mouth to Boulder Creek	July 1 - September 15	
		- Beckler River (07.1413) - above Boulder Creek	July 15 - October 31	
		- Rapid River (07.1461) - mouth to Meadow Creek	July 15 - September 15	
		- Rapid River (07.14610 - above Meadow Creek	July 15 - October 31	
		~~- Foss River (07.1562) - mouth to forks~~	~~July 15 - September 15~~	
		~~- West Fork Foss River (07.1573)~~	~~July 15 - October 31~~	
		~~- East Fork Foss River (07.1562)~~	~~July 15 - September 30~~	Char (BT??)
		~~- Miller River (07.1329) - mouth to forks~~	~~July 1 - September 15~~	
		~~- Miller River (07.1329) - above forks~~	~~July 1 - October 31~~	
		- Sultan River (07.0881) - mouth to old diversion dam	July 15 - August 31	STW
		- Sultan River (07.0881) - old diversion dam to Culmback Dam	July 1 - October 31	
		- tributaries above Culmback Dam	August 1 - October 31	
		- Wallace River (07.0940) - mouth to Wallace Falls	July 1 - September 1	
		- Olney Creek (07.0946) - mouth to Olney Falls	July 1 - September 15	
		- Olney Creek (07.0946) - above Olney Falls	July 1- October 31	
		- Wallace River (07.0940) above Wallace Falls	July 1 - October 31	
		- Snoqualmie River (07.0219)	July 1- August 31	
		- all other Snohomish River tributuaries	July 1 - August 31	
		Stillaguamish River (05.0001) - mouth to forks	July 1 - August 31	
		- South Fork Stillaguamish River (05.0001)	July 15 - August 15	CHS, STW
		~~- Canyon Creek (05.0359)~~	~~??????????????~~	
		- North Fork Stillaguamish River (05.0135) - mouth to falls	July 15 - August 15	CHS, STW
		~~- Deer Creek (05.0173)~~	~~??????????????~~	

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season [1] by County		Exceptions to General Season [2]		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed [2]	Activity Is Allowed Only Between These Dates	Species Protected [4]
Spokane	June 15 - August 31	Latah Creek (56.0003) - mainstem - tributaries Lakes	June 15 - October 31 June 15 - August 31 March 15 - May 10 and July 1 - September 30	
Stevens	July 1 - August 31	Big Sheep Creek (61.0150) - mouth to Sheep Creek Falls Big Sheep Creek (61.0150) - above Sheep Creek Falls Lakes	?????????????? July 1 - August 31 March 15 - May 10 and July 1 - September 30	
Thurston	July 15 - September 15	Cedar Creek (23.0570) Little Deschutes River (13.0110) McLane Creek (13.0138) Nisqually River (11.0008) - mainstem - Nisqually River tributaries Porter Creek (23.0543) Schneider Creek (14.0009) Skookumchuck River (23.0761) Woodard Creek (13.0012) Woodland Creek (13.0006)	July 15 - September 30 July 15 - October 31 July 15 - October 31 July 1 - August 31 July 1 - September 15 July 15 - September 30 July 1 - October 31 July 1 - August 31 July 1 - October 31 July 1 - October 31	CHF CHF
Wahkiakum	July 15 - September 15	Elochoman River (25.0236) Grays River (25.0093) Naselle River (24.0543)	August 1 - September 30 August 1 - September 30 July 15 - September 30	
Walla Walla	July 15 - ~~October 31~~ September 30 [5]	Walla Walla River (32.0008)	July 15 - August 15	BT, CHSP, ST

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season [1] by County		Exceptions to General Season [2]		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed [2]	Activity Is Allowed Only Between These Dates	Species Protected [4]
Whatcom	July 1 - September 30	Nooksack River (01.0120) - mouth to Mt Baker Hwy Bridge	June 15 - August 31 in odd years only; June 15 - September 30 in even years only	
		Nooksack River (01.0120) - Mt Baker Hwy Bridge to forks	June 15 - August 15	
		- North Fork Nooksack River (01.0120) - mouth to Nooksack Falls	~~June 15 - July 31~~ July 15 - July 31	STW
		- North Fork Nooksack River (01.0120) - above Nooksack Falls	July 1 - September 30	
		- Middle Fork Nooksack River (01.0339) - mouth to City of Bellingham diversion dam	~~June 15 - July 31~~ July 15 - July 31	STW
		- Middle Fork Nooksack River (01.0339) -above City of Bellingham diversion dam	July 1 - September 30	
		- South Fork Nooksack River (01.0246)	~~June 15 - August 15~~ July 15 - August 15	STW
		Samish River (03.0005)	June 15 - September 30	
		Skagit River (03.0176/04.0176)	~~June 15 - July 31~~ July 15 - July 31	STW
		- Baker River (04.0435)	July 1 - September 30	
		- Ross Lake tributaries		
		- Canyon Creek	August 1 - September 30	
		- Ruby Creek	August 1 - September 30	
		- Slate Creek - mouth to Slate Creek Falls	August 1 - September 30	
		- Slate Creek - above Slate Creek Falls	July 1 - September 30	
Whitman	June 15 - October 15	Palouse River (34.0003) - mouth to falls	June 1 - September 30	
Yakima	June 1 - September 30	Klickitat River (30.0002)	~~July 1 - August 15~~ June 15 - August 1	CHSP
		Yakima River (37.0002/38.0002/39.0002) - mouth to Roza Dam	June 1 - September 15	
		- Ahtanum Creek (37.1382)	July 1 - August 15	BT, ST
		- Naches River (38.0003) - mouth to Tieton River	June 1 - October 31	
		- Tieton River (38.0166)	June 1 - August 15	
		- Indian Creek (Rimrock Lake) (38.0302)	July 1 - July 31	
		- Naches River (38.0003) - above confluence of Tieton River	June 1 - August 15	
		- Bumping River (38.0998)	July 15 - August 15	
		- American River (38.1000)	July 1 - July 15	
		- Little Naches River (38.0852)	July 15 - August 15	
		- Rattlesnake Creek (38.0518)	July 15 - August 15	
		- Wenas Creek (39.0032)	August 1 - October 31	
		- other Yakima River tributaries	July 15 - August 31	
Columbia River - mouth to Snake River - Snake River to Priest Rapids Dam - above Priest Rapids Dam	November 1 - February 28 August 1 - August 31 July 1 - August 31	All Columbia River tributaries	See county listings	
Snake River	August 1 - August 31	All Snake River tributaries	See county listings	

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season [1] by County		Exceptions to General Season [2]		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed [2]	Activity Is Allowed Only Between These Dates	Species Protected [4]
Lakes[3] - Non-salmonid bearing - Eastern WA - Western WA - Salmonid bearing	~~March 15 - April 15~~ June 10 - April 1 July 16 - ~~April 30~~ February 28 July 1 - August 15	See county listings	See county listings	

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS				
Tidal Reference Area	*General Season Activity Is Allowed Only Between These Dates*	*Exceptions to General Season* [2]		
		Exception	*Activity Is Allowed Only Between These Dates*	*Species Protected*
1 (Shelton): All saltwater areas in Oakland Bay and Hammersley Inlet westerly of a line projected from Hungerford Point to Arcadia.	June 15 - March 14 — April 1 - January 14 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None — None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
2 (Olympia): All saltwater areas between a line projected from Hungerford Point to Arcadia and a line projected from Johnson Point to Devil's Head. This includes Totten, Eld, Budd, Case and Henderson Inlets, and Pickering Passage.	June 15 - March 14 April 1 - June 30 April 1 - January 14 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
3 (South Puget Sound): All saltwater areas easterly and northerly of a line projected from Johnson Point to Devil's Head and southerly of the Tacoma Narrows Bridge.	June 15 - March 14 May 1 - September 30 April 1 - January 14 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS				
Tidal Reference Area	*General Season Activity Is Allowed Only Between These Dates*	*Exceptions to General Season* [2]		
		Exception	*Activity Is Allowed Only Between These Dates*	*Species Protected*
4 (Tacoma): All saltwater areas northerly of the Tacoma Narrows Bridge and southerly of a line projected true west and true east across Puget Sound from the northern tip of Vashon Island.	June 15 - March 14 April 15 - September 30 April 15 - January 14 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
5 (Seattle): All saltwater areas northerly of a line projected true west and true east across Puget Sound from the northern tip of Vashon Island and southerly of a line projected true east from Point Jefferson at 47˚ 15' N. latitude across Puget Sound. This area includes Port Orchard, Port Madison, and Dyes and Sinclair Inlets.	June 15 - March 14 April 1 - August 31 May 1 - January 14 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None - Eagle Harbor - Sinclair Inlet None None None None None	 Year round Year round	Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
6 (Edmonds): All saltwater areas northerly of a line projected true east from Point Jefferson at 47˚ 15' N. latitude across Puget Sound and southerly of a line projected true east from Possession Point to Chenault Beach and from Foulweather Bluff to Double Bluff.	June 15 - March 14 April 15 - September 30 — March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None — — None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS				
Tidal Reference Area	*General Season Activity Is Allowed Only Between These Dates*	*Exceptions to General Season [2]*		
		Exception	*Activity Is Allowed Only Between These Dates*	*Species Protected*
7 (Everett): All saltwater areas northerly of a line projected true east from Possession Point to Chenault Beach, easterly of a line projected 5˚ true from East Point to Lowell Point, and southerly of the Stanwood to Camano Island Highway. This area includes Port Gardner, Port Susan, and parts of Possession Sound and Saratoga Passage.	June 15 - March 14 Year round April 15 - January 31 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
8 (Yokeko Point): All saltwater area westerly and northerly of a line projected 5˚ true from East Point to Lowell Point, north of the Stanwood to Camano Island Highway, and easterly and southerly of Deception Pass Bridge and the Swinomish Channel Bridge on State Highway 536. This area includes Holmes Harbor, Saratoga Passage, Skagit Bay, Similk Bay, and most of the Swinomish Channel.	June 15 - March 14 Year round April 15 - January 31 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
9 (Blaine): All saltwater area in Skagit County and Whatcom County that lies northerly of the Swinomish Channel Bridge on State Highway 536 and westerly and northerly of Deception Pass Bridge.	June 15 - March 14 Year round — March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None - South of a line running due west from Governor's point - North of a line running due west from Governor's point None None None None	April 15 - January 31 June 15 - January 31	Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS				
Tidal Reference Area	*General Season Activity Is Allowed Only Between These Dates*	*Exceptions to General Season* [2]		
		Exception	*Activity Is Allowed Only Between These Dates*	*Species Protected*
10 (Port Townsend): All saltwater area of Puget Sound as defined in WAC 220-16-210 except Hood Canal south of a line projected from Tala Point to Foulweather Bluff, and except all waters defined in Tidal Reference Areas 1 through 9. Area 10 includes waters of the San Juan Islands, Admiralty Inlet, the Strait of Juan de Fuca, and associated bays and inlets.	June 15 - March 14 — May 1 - January 14 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None - Kilisut Harbor - Dungeness Bay - Twin Rivers - Deep Creek - San Juan Islands None None None None None	 November 1 - September 14 January 15 - October 14 September 1 - April 30 September 1 - April 30 Year round	Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod
11 (Union): All saltwater area of Hood Canal southerly and easterly of a line projected from Lilliwaup Bay to Dewatto Bay.	June 15 - March 14 March 2 - September 14 April 1 - January 14 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
12 (Seabeck): All saltwater areas of Hood Canal northerly of a line projected from Lilliwaup Bay to Dewatto Bay and southerly of a line projected true east from Hazel Point. This area includes Dabob Bay and Quilcene Bay.	June 15 - March 14 — April 15 - February 14 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None — None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS				
Tidal Reference Area	*General Season Activity Is Allowed Only Between These Dates*	*Exceptions to General Season* [2]		
		Exception	*Activity Is Allowed Only Between These Dates*	*Species Protected*
13 (Bangor): All saltwater area of Hood Canal northerly of a line projected true east from Hazel Point and south of a line projected from Tala Point to Foulweather Bluff. This area includes Port Gamble.	June 15 - March 14 February 1 - October 14 April 15 - January 14 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
14 (Ocean Beaches): All saltwater area between Cape Flattery and the Oregon border at the mouth of the Columbia River, excluding Grays Harbor and Willapa Bay.	June 15 - February 28 — — March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None — — None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
15 (Westport): All saltwater area in Grays Harbor easterly of a line projected from the outermost end of the north jetty to the outermost end of the south jetty, and westerly of 123˚ 59' W. longitude.	June 15 - February 28 — — March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None — — None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS				
Tidal Reference Area	***General Season Activity Is Allowed Only Between These Dates***	***Exceptions to General Season [2]***		
		Exception	***Activity Is Allowed Only Between These Dates***	***Species Protected***
16 (Aberdeen): All saltwater area in Grays Harbor easterly of 123˚ 59' W. longitude and westerly of the ~~Union Pacific railroad~~ US HWY 101 bridge across the Chehalis River. NOTE: The RR bridge is no longer there.	June 15 - February 28 — — March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None — — None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
17 (Willapa Bay): All saltwater area in Willapa Bay easterly of a line projected from Leadbetter Point to Cape Shoalwater Light.	June 15 - February 28 — March 15 - January 31 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None — None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout (present?)

1. The General Season for a county applies to all streams within that county, **unless** a specific season is given for a listed stream in that county under Exceptions to the General Season. Some streams flow through multiple counties. Check the listing for the county in which you propose to work to determine the open season for that stream.

2. The season for a listed Exception to the General Season applies to **all** its tributaries, **unless** a tributary of that stream is also listed with a separate season. Such tributaries are listed below the parent stream with and indent and a (-). Some streams flow through multiple counties. Check the listing for the county in which you propose to work to determine the open season for that stream. ?????????????? means either a separate or supplemental HPA is required.

3. Columbia and Snake River reservoirs are **not** considered lakes. Lake is defined in WAC 220-110-020(47) as any natural or impounded body of standing freshwater, except impoundments of the Columbia and Snake Rivers. Timing applies as noted, except where specific timing by county indicates otherwise.

4. Species Protected: Species listed provide the primary basis for timing guidelines. The species list should be considered general information and is not comprehensive.

5. Proposed changes from staff did not include justification for the change. Justification required to finalize change.

BT - bull trout
CHF - fall chinook salmon
CHS - summer chinook salmon
CHSP - spring chinook salmon
CT - cutthroat trout (includes sea run)
SO - sockeye salmon
STS - summer steelhead
STW - winter steelhead

CO - coho salmon
CM - chum salmon

T - various other species of trout
WW - various warm water game fish