



HYDRAULIC CODE RULE CHANGES

Proposed Title 220-660
Washington Administrative Code

Supplemental DRAFT

Programmatic Environmental Impact Statement



Habitat Improvement



Buoys



Flood Control Devices



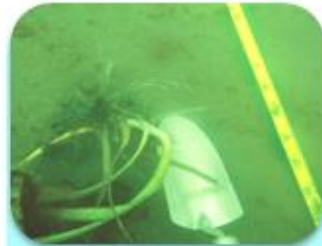
Bank Protection



Boat & Equipment Access



Overwater Structures



Aquatic Plant Control



Marinas



Dredging



Culverts



Fish Passage Correction



Fish Screens

Mission
of the
Washington Department of Fish and Wildlife

To preserve, protect and perpetuate fish, wildlife, and ecosystems
while providing sustainable fish and wildlife
recreational and commercial opportunities.



State of Washington
Department of Fish and Wildlife

Mailing Address: 600 Capitol Way N, Olympia WA 98501-1091, (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building, 1111 Washington Street SE, Olympia WA

July 16, 2014

Dear Interested Parties:

The Washington Department of Fish and Wildlife (WDFW) has prepared this Supplemental Draft Programmatic Environmental Impact Statement (SDPEIS) on proposed changes to the Hydraulic Code Rules in Chapter 220-110 Washington Administrative Code (WAC). The SDPEIS meets the requirements of the State Environmental Policy Act (SEPA) in Chapter 43.21C RCW, SEPA rules in Chapter 197-11 WAC, and other relevant state laws and regulations. The proposed rule changes and the SDPEIS are now available for a 30-day public comment period.

WDFW protects fish life by using its authority to provide approvals for construction projects in or near waters of the state. WDFW issues Hydraulic Project Approvals (HPAs) for projects that use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state. HPAs are issued based on the Hydraulic Code Rules. WDFW is revising the Hydraulic Code Rules to improve protections for fish and streamline the permit approval process.

The Hydraulic Code Rules, except those for mineral prospecting, were last updated in 1994 before Washington fish species were listed under the Endangered Species Act. There have also been changes to the hydraulic code (Chapter 77.55 RCW), to other regulations, and to fish science and design technology during that time. The current Hydraulic Code Rules do not reflect those changes. WDFW is rewriting and replacing the entire chapter so that the content is easier for the applicant to understand, to reflect statutory changes in procedure, and to update rules based on contemporary science and design technology.

MAJOR CONCLUSIONS

This is a non-project review proposal. The purposes of the proposed rule changes are to update the rules to better align with statutory changes, meet current fish science and design technology, and improve procedural and administrative requirements. Specifically the rule changes will:

- Incorporate up-to-date fish science and technology;
- Simplify the permitting of certain types of projects;
- Improve procedural and administrative requirements to better align with statutory changes made since the rules were last revised; and
- Establish a structure for adaptive management that responds to changing science and technology and/or the results of effectiveness monitoring.

These actions will deliver cost and time savings for some applicants, improve the overall effectiveness of the program, eliminate inconsistencies between the statute and the rules, and enhance a transparent decision making process with our stakeholders.

AREAS OF CONTROVERSY

Areas of controversy include water crossing structures, timing windows, and changes that are necessary to implement legislation, including rules for single family bulkheads, tidegates and flood gates. Many people are concerned about the cumulative effects of HPAs issued by the agency. While the hydraulic code prevents considering issues beyond the proposed project, we can't deny that there are cumulative effects to the environment from hydraulic projects and development. WDFW's goal is to help applicants develop a project that best meets their needs while providing protection to fish life.

See Fact Sheet for details on document availability and commenting.

WDFW believes this SDPEIS will assist decision makers to identify the key environmental issues and options associated with this action. Based on comments received from agencies and interested parties during public review of this draft document and the associated proposed rule changes, WDFW plans to prepare and distribute a Final Programmatic Environmental Impact Statement in fall, 2014.

Sincerely,

A handwritten signature in cursive script that reads "Lisa Wood".

Lisa Wood
SEPA/NEPA Coordinator
Agency Responsible Official
Protection Division
Habitat Program

SEPA Fact Sheet – SDPEIS 14-049

Title: Hydraulics Code Rule Changes – Supplemental Draft Programmatic Environmental Impact Statement

Description: The Washington State Department of Fish and Wildlife (WDFW) has prepared this Supplemental Draft Programmatic Environmental Impact Statement (SDPEIS) on the Hydraulic Code Rule Changes. This document was prepared in compliance with the Washington State Environmental Policy Act (SEPA).

The Hydraulic Code Rules, except those for mineral prospecting, were last updated in 1994 before Washington fish species were listed under the Endangered Species Act. The purposes of the proposed rule changes are to update the rules to better align with statutory changes, meet current fish science and design technology, and improve procedural and administrative requirements. Specifically the rule changes will:

- Incorporate up-to-date fish science and technology;
- Simplify the permitting of certain types of projects;
- Improve procedural and administrative requirements to better align with statutory changes made since the rules were last revised; and
- Establish a structure for adaptive management that responds to changing science and technology and/or the results of effectiveness monitoring.

Location: Statewide

Proposed Date of Implementation: Fall 2014

Project Proponent: Washington Department of Fish and Wildlife
Habitat Program, Protection Division

Project Manager: Randi Thurston
Habitat Program, Protection Division
Washington Department of Fish and Wildlife
600 Capitol Way North
Olympia, WA 98501-1091
Phone: (360) 902-2602
E-mail: randall.thurston@dfw.wa.gov

Lead Agency: Washington Department of Fish and Wildlife
600 Capitol Way North
Olympia, WA 98501-1091

Responsible Official: Lisa Wood
600 Capitol Way North
Olympia, WA 98501-1091
Phone: (360) 902-2260
Email: SEPAdesk2@dfw.wa.gov

Method of Comment: Comments received through these procedures are part of the official SEPA record for this proposal. You can submit your comments or questions any **one** of the following ways:

- Email to SEPAdesk2@dfw.wa.gov
- Online at the WDFW SEPA website comment link at: http://wdfw.wa.gov/licensing/sepa/sepa_comment_docs.html
- Fax to (360) 902-2946
- Oral or written comments at the Fish and Wildlife Commission meeting scheduled for August 8, 2014
- Mail to: Lisa Wood, SEPA Responsible Official, 600 Capitol Way North, Olympia, WA 98501-1091

When you send us your comments on the SDPEIS, please include the name of the proposal and your name in the subject line of your comment, as below:

Comment on Hydraulic Code Rule Changes SDPEIS - Your Name

Permits and Licenses Required: No permits, licenses, or approvals are required for the proposed Hydraulic Code Rule Changes. Adoption of the rule changes is in compliance with Chapter 34.05 RCW (Administrative Procedure Act) Part III Rule-Making Procedures.

Authors and Principle Contributors:

WDFW: Randi Thurston, Teresa Scott, and Pat Chapman

Consultants: ESA Environmental Consultants and Cardno ENTRIX

Date of Issue: July 2014

Comments Due: Agencies, affected tribes, and members of the public are invited to review and comment on this SDPEIS. We are accepting comments on the SDPEIS beginning July 16, 2014. We must receive your comments on the SDPEIS within 30 days of the date of issuing this SDPEIS. ***This means we must receive your comments no later than 5:00 PM on Friday, August 15, 2014.***

Concurrent with SDPEIS review, we are also taking comments on the proposed rule changes, through August 15, 2014. Comments received through August 1 will be summarized and presented to the Fish and Wildlife Commission at their meeting scheduled for August 8, 2014. Public comments will also be taken at the August 8 hearing. When you send us your comments on the proposed rule changes, please include the name of the proposal and your name in the subject line of your comment, as below:

Comment on Hydraulic Code Rule Changes - Your Name

Public Participation: An opportunity for the public to testify to the Fish and Wildlife Commission with comments about the HPA rule changes and SDPEIS will occur as follows:

DATE	TIME	LOCATION
August 8, 2014	To Be Determined	Olympia, Washington

Date of Next Action and Date Final Action is Planned: WDFW anticipates releasing the Final Programmatic Environmental Impact Statement on the Hydraulic Code Rules in fall, 2014. We anticipate that final action by the Fish and Wildlife Commission to adopt the rule changes will occur on or after September 26, 2014.

Document Availability: The SDPEIS, Hydraulic Code Rule Change Proposals, Cost-Benefit Analysis and Small Business Economic Impact Statement, HPA Aquatic Habitat Guidelines and “White Papers”, List of Science References, and other materials referenced in the SDPEIS are available at no charge at: <http://wdfw.wa.gov/licensing/hpa/rulemaking/> or at:

Washington Department of Fish and Wildlife,
Habitat Program, Protection Division
Natural Resources Building, 5th Floor
1111 Washington Street East
Olympia, WA
[Mailing address: 600 Capital Way North, Olympia, WA 98501-1091]

These documents may be obtained in hard copy or CD by written request to the SEPA Responsible Official listed above, or by calling (360) 902-2260. Supplies are limited. To ask about the availability of these documents in a format for the visually impaired, call WDFW at 360-902-2534. Persons with hearing loss can call 711 or 1-800-833-6388 for Washington Relay Service, including TTY service. Persons with a speech disability can call 1-877-833-6341 to access a Communications Assistant with Washington’s Speech-to-Speech service.

Distribution List: Notice of the availability of this SDPEIS is posted on the WDFW SEPA website: http://wdfw.wa.gov/licensing/sepa/sepa_comment_docs.html, sent to local planning departments (city and county), affected Tribes, all state and federal agencies with jurisdiction, selected environmental organizations, individuals who have already commented on draft rules or EIS scoping, and interested parties.

Acronyms and Abbreviations

BMP	best management practice
CFR	Code of Federal Regulations
cfs	cubic feet per second
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DAHP	Department of Archaeology and Historic Preservation
DPS	Distinct Population Segment
Ecology	Washington Department of Ecology
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESSB	Engrossed Substitute Senate Bill
ESU	Evolutionarily Significant Unit
F	Fahrenheit
FPA	Forest Practices Act
GMA	Growth Management Act
HCP	Habitat Conservation Plan
HPA	Hydraulic Project Approval
JARPA	Joint Aquatic Resources Permit Application
LWD	large woody debris
LWM	large woody material
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
OHWL	ordinary high water level
OHWM	ordinary high water mark
PATON	Private Aids to Navigation
PCBs	polychlorinated biphenyls
PEIS	Programmatic Environmental Impact Statement
RCW	Revised Code of Washington
SBEIS	Small Business Economic Impact Statement
SEPA	State Environmental Policy Act
SMA	Shoreline Management Act
TMDL	Total Maximum Daily Load
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources

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Chapter 1 Introduction and Background

The Washington Department of Fish and Wildlife (WDFW) issued the Draft Programmatic Environmental Impact Statement (Draft PEIS) on proposed changes to the hydraulic code rule (Chapter 220-110) Washington Administrative Code (WAC) in October 2013. WDFW received numerous public comments on the DPEIS during the public comment period that ended December 13, 2013. In addition, the 2014 Washington State Legislature passed amendments to Revised Code of Washington (RCW) 34.05.271 that clarify how WDFW is required to identify sources of information reviewed and relied upon in preparing to take a significant agency action, including changes to agency rules. In response to the public comments and amendments to RCW 34.05.271, WDFW has decided to prepare a Supplemental Draft Programmatic Environmental Impact Statement (SDPEIS) on the proposed hydraulic code rule changes.

WDFW protects fish life by using its authority to provide approvals for construction or work that might affect the flow or bed of waters of the state. Specifically, WDFW issues Hydraulic Project Approvals (HPAs) for construction or performance of work that will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state. HPAs are issued and provisioned based on the Hydraulic Code Rules, which implement Chapter 77.55 RCW (Construction Projects in State Waters). WDFW is proposing revisions to the Hydraulic Code Rules primarily to improve protections for fish life. The Hydraulic Code Rules, except those for mineral prospecting, were last updated in 1994 before Washington fish species were listed as threatened or endangered under the Endangered Species Act (ESA). There have also been many changes to the statute, fish science, and design technology in that time. Updates to the Hydraulic Code Rules are needed to improve the consistency of the rules with statutory changes that have occurred since the last update, and incorporate more current fish science and design technology.

WDFW initially undertook revision of the Hydraulic Code Rules in 2006 as part of the process of preparing a Habitat Conservation Plan (HCP) for the Hydraulic Project Approval (HPA) Program. An HCP is a management strategy under ESA that can provide long-term certainty of ESA compliance. It can be used for a particular set of activities, such as administrative rules, while providing conservation of ESA-listed species. WDFW was developing an HCP to assure that agency permitting actions contributed to conservation and recovery of listed species and to provide federal assurances to permit holders for activities under an HPA. Updating the Hydraulic Code Rules was a centerpiece of developing the HCP. WDFW discontinued work on the HCP in 2012 when stakeholder and tribal support waned. However, WDFW has continued to work on revisions to the Hydraulic Code Rules.

WDFW intends to complete adoption of the rules in 2014. This SDPEIS is being prepared as part of the rule making process. Update of the hydraulic code rules constitutes a major overhaul of the rule language. Because of this, the updated rules would appear under a new rule section – Title 220-660 WAC. If changes to hydraulic code rules are adopted, the current rules in Title 220-110 WAC will be superseded by the new rules in Title 220-660. If no changes are adopted, Title 220-110 as it exists today will remain in effect.

Comments on the SDPEIS and proposed rules are being taken separately but concurrently.

The sections in this chapter include descriptions of:

- The purpose and need for the proposed action;
- Summary of Draft PEIS comments;
- Statutory authority for the proposed action;
- The State Environmental Policy Act (SEPA) review process;
- Related regulations and policies;
- Public involvement; and
- A guide to reading this document.

1.1 Project Purpose and Need

Several changes to hydraulic code statutes have occurred since the last comprehensive hydraulic code rule update in 1994 (more details can be found in Table 2-1). In some cases, current rules are incomplete with respect to current statute. Updating the rules to better align with current statute is one important purpose for the hydraulic code rules update.

In addition, understanding of the impacts of hydraulic projects on fish life and habitat has advanced since the last rule update; however, no modifications to rule provisions have been implemented to take advantage of those advances. The current rules also do not reflect technological advancements for constructing many hydraulic projects and the rules are inconsistent with best practices, resulting in overly restrictive provisions in some cases and overly permissive provisions in other cases. In addition, certain administrative aspects of submitting and processing applications need to be updated to reflect improved methods of filing and processing applications.

New rules will result in clear application and permit-processing procedures for applicants and WDFW, bring rules into alignment with current statute, and will enable WDFW to apply available science and technology to prevent or mitigate the impacts to fish life and habitat caused by hydraulic projects.

The purposes of the proposed rule changes are to update the hydraulic code rule provisions to respond to statutory changes, integrate current fish science and design technology, and improve procedural and administrative requirements. Specifically the rule changes will:

- Incorporate up-to-date fish science and technology;
- Simplify the permitting of certain types of projects;
- Improve procedural and administrative requirements to better align with statutory changes made since the rules were last revised; and
- Establish a baseline for adaptive management in response to changing science and technology and/or the results of effectiveness monitoring.

These actions will save time and costs for some applicants, improve the overall effectiveness of the program, better align the rules and statute, and enhance a transparent decision-making process with Tribes and stakeholders.

1.2 Summary of Draft PEIS Comments

WDFW issued the Draft Programmatic Environmental Impact Statement (Draft PEIS) on the Hydraulic Code Rule Changes in October 2013. WDFW received numerous public comments on the DPEIS during the comment period, which ended December 13, 2013. Also, during the 2014 Washington State Legislature, lawmakers passed amendments to RCW 34.05.271, which clarifies how WDFW is to identify sources of information reviewed and relied upon in preparing to take a significant agency action including changes to agency rules. In response to the public comments and amendments to RCW 34.05.271, WDFW decided to prepare a SDPEIS on the proposed rule changes.

Comments included those related to the SEPA process, the evaluation of economic impacts, and the lack of detail in some EIS sections and in some impacts analysis. Many of the comments expressed concern with how WDFW had incorporated science into the rule-making process. Many also commented on the limited array of alternatives analyzed in the EIS (only the preferred alternative and a no-action alternative were presented in the draft PEIS).

There were also several comments specific to the proposed rules. Those comments did not relate to the adequacy of the SEPA analysis, but focused on aspects of the rules that the commenters wanted WDFW to change. Upon careful consideration of the comments received, WDFW made changes to the proposed rules, and added two alternatives to the SEPA analysis.

Four main categories of comment are addressed in the supplemental draft PEIS: Incorporation of available science, evaluating additional alternatives, process and timing of the draft PEIS (with respect to the rulemaking process under the Administrative Procedures Act), and discussion of economic impacts and the timing of the Small Business Economic Impact Statement. These topics are addressed as follows.

1.2.1 Incorporation of Available Science

Comments related to incorporating available science stated that WDFW was not in compliance with RCW 34.05.271. This statute includes specific requirements for how WDFW should identify and make available the sources of information used in taking a significant agency action. The comments also stated that some of the white papers cited by WDFW in the DPEIS were not up to date and were not cited properly.

The Draft PEIS included information on the science reviewed, but it was not presented so that readers could clearly see how the science was used in developing the alternatives, assessing the impacts, and the proposed rule changes. WDFW moved the *Science Supporting the Proposed Alternative* section of the Draft PEIS (Section 2.4.4 in the DPEIS) up to the *Formulation of Alternatives* section in Chapter 2 of the Supplemental Draft PEIS. This change highlights the science that was used in formulating the alternatives and also introduces the science before the new rules are described in more detail.

1.2.2 Incorporation of Additional Alternatives

SEPA (WAC 197-11-440(5)(a)) requires that an Environmental Impact Statement (EIS) evaluate alternative courses of action to the proposal. The alternatives must be reasonable actions that could feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased

level of environmental degradation (WAC 197-11-440(5)(b)). SEPA also includes requirements for evaluating alternatives for a non-project or programmatic proposal such as adopting new rules (WAC 197-11-442).

The requirements are intended to give the lead agency more flexibility in preparing an EIS for a programmatic proposal because less detail is available than for a project-specific proposal. The SEPA rules recommend that a programmatic EIS emphasize the evaluation of alternatives and that the alternatives, including the proposed action, be analyzed at a roughly comparable level. For a programmatic analysis, lead agencies are not required to examine all conceivable policies, but may limit the EIS to a discussion of alternatives which have been formally proposed or are reasonably related to the proposed action (WAC 197-11-442(4)). According to SEPA, the discussion of alternatives must be limited to a general discussion of the impacts of alternative proposals.

In the Draft PEIS, WDFW evaluated two alternatives—the Preferred Alternative (the proposed rule changes) and the No Action Alternative. Section 2.5 of the Draft PEIS also included a discussion in of alternatives and proposed rule changes that had been presented to the public as part of scoping, but had been eliminated from further detailed study. Several comments stated that WDFW should have evaluated additional alternatives including those that were presented in scoping for the Draft PEIS.

WDFW considered three approaches the department could take to evaluate additional alternatives in the Supplemental Draft PEIS. The first approach was to provide additional analysis and explanation in Section 2.5 of why the alternatives were eliminated from consideration. The second approach was to further evaluate the alternatives presented to the public during the scoping. The third approach was to evaluate the alternatives received during the public comment period that were not included in the Preferred Alternative. WDFW chose to do two out of the three: WDFW expanded the explanations of eliminated alternatives so that the public can better understand the reasons the alternatives were not incorporated into the rule making process. WDFW also evaluated alternatives compiled from comments received during the Draft PEIS public comment period and included discussion of those additional alternatives in Chapter 4. Because changes recommended in the comments were not presented in rule-change form, the discussion of the additional alternatives is limited to a listing of the suggested provisions and general discussions of the differences in impacts between the suggestions and the no-action alternative.

1.2.3 Process and Timing of the Draft PEIS

Some comments expressed concerns about the public input process and that the Draft PEIS was issued before WDFW had finalized the proposed rule changes. Comments about public input included statements that the stakeholder group WDFW established to provide advice on the proposed rule changes did not have broad enough representation.

To address these comments, WDFW is incorporating the final proposed rule changes into the Supplemental Draft PEIS, making the proposed rule changes available for further comment as well as the Supplemental Draft PEIS. WDFW will respond to specific comments on the proposed rule changes in the Final PEIS.

1.2.4 Economic Analysis and Timing of the Small Business Economic Impact Statement

A few comments stated that the Draft PEIS did not include a cost-benefit analysis and others stated that the Draft PEIS had been released before the Small Business Economic Impact Statement (SBEIS) had been prepared. SEPA does not require a cost-benefit analysis (WAC 197-11-450). To comply with SEPA, an environmental analysis focuses on impacts to the environment; SEPA rules state that the comparison of alternatives should not be displayed as a monetary cost-benefit analysis when there are important qualitative considerations.

When an agency adopts a rule change, an economic analysis is required if the rule is expected to impose more than minor costs on businesses in an industry (RCW 19.85.030). This analysis is conducted through a SBEIS and a cost/benefit analysis that the agency files with the code reviser along with the notice required before a rule-making hearing (RCW 34.05.320). If the SBEIS determines a rule change will cause a disproportionate impact on small businesses, the agency shall, where legal and feasible in meeting the stated objectives of the rule, reduce the costs imposed on small businesses.

WDFW prepared an SBEIS economic analysis for the proposed changes to the Hydraulic Code Rules. WDFW provided the SBEIS and cost/benefit analysis when the final draft proposed rules (CR102) were filed with the Washington State code reviser.

1.3 Statutory Authority

WDFW has sole authority to implement the Hydraulic Code Rules (Chapter 220-110 WAC) under Chapter 77.55 RCW (Construction Projects in State Waters). RCW 77.55.021 (1) states “...*In the event that any person or government agency desires to undertake a hydraulic project, the person or government agency shall, before commencing work thereon, secure the approval from the department in the form of a permit ...*” RCW 77.55.011(11) defines a “hydraulic project” as “*the construction or performance of work that will use, divert, obstruct, or change the natural flow or bed of any of the salt or freshwater of the state.*” Although both “bed” (RCW 77.55.011(1)) and “waters of the state” (RCW 77.55.011(25)) are defined as land or waters waterward of the “ordinary high water line” (RCW 77.55.011(16)), the definition of a hydraulic project includes construction or performance of work landward of the ordinary high water line if it will use, divert, obstruct, or change the natural flow or bed waterward of the ordinary high water line.

The construction permit issued by the department is called a Hydraulic Project Approval (HPA). The sole purpose of HPA is to protect fish life from construction and other work in or near the water. The HPA has conditions a permittee must follow that mitigate impacts to fish life caused by the project. The department cannot unreasonably withhold or unreasonably condition the HPA (RCW 77.55.021(7)(a)).

The role of the HPA in context with other local, state, and federal permits and authorizations is explored further in section 1.5.7.

1.4 Environmental Policy Act Review Process

This document is prepared at a programmatic level in accordance with the State of Washington SEPA Rules (Chapter 197-11 WAC). This Supplemental Draft PEIS evaluates the adoption of the updated

Hydraulic Code Rules under WAC 197-11-704(2)(b)(i). This Supplemental Draft PEIS evaluates alternatives and the potential negative or beneficial impacts of adopting the updated rules. It does not evaluate the site-specific impacts of activities requiring an HPA. Generally, projects that require an HPA undergo site-specific SEPA review by the lead agency before WDFW issues an HPA. The Fish and Wildlife Commission (FWC) will use information from this Supplemental Draft PEIS to evaluate reasonable alternatives. These alternatives must comply with state law and be within the Commission's authority to control. Several commenters on the October 2013 Draft PEIS suggested the PEIS analyze the impacts of implementing the changes to Chapter 77.55 RCW that have occurred since 1994. Others suggested changes to existing statute. However, since statutory changes are not within the Commission's authority to control they are mentioned but not analyzed in the Supplemental Draft PEIS.

1.5 Related Regulations and Policies

This section describes the major regulations and policies that relate to hydraulic projects. These regulations and policies are implemented by a variety of entities and agencies including the Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (Corps), Washington Department of Ecology (Ecology), Washington Department of Natural Resources (WDNR), and local governments.

1.5.1 Aquatic Resources Protection Permits

The Joint Aquatic Resources Permit Application (JARPA) process is used by multiple regulatory agencies in Washington State to allow project proponents to use a single form to apply for multiple aquatic resources protection permits. Although WDFW has an online permit processing tool, the JARPA form can still be used to apply for an HPA as well as the following approvals:

- Federal: Section 10 and Section 404 permits (Corps) and Private Aids to Navigation (PATON) approvals (U.S. Coast Guard);
- State: 401 Water Quality Certification (Ecology);
- Aquatic Use Authorization (WDNR); and
- Local: Shoreline Substantial Development Permits, Shoreline Conditional Use Permits, Shoreline Variances, and Shoreline Substantial Development Exemptions, unless local governments have their own permit applications.

1.5.2 Endangered Species Act

The federal ESA was enacted by Congress in 1973 in response to concerns over the decline of a number of fish and wildlife species. The purposes of the ESA are to protect endangered or threatened species and to provide a means to conserve their habitats. The ESA is administered by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), collectively called "the Services". The USFWS has primary jurisdiction of terrestrial (land) and freshwater species, while NMFS has jurisdiction over marine species such as salmon and marine mammals.

The primary provision of the ESA that applies to hydraulic projects is Section 7 that requires proponents of projects that have a federal "nexus" to consult with the USFWS and NMFS to determine if the project would affect listed species. A federal nexus occurs if a project is located on federal land; receives federal funding; or requires a federal permit, license, or other authorization. USFWS and NMFS

designate critical habitat for listed species. Critical habitat includes the area occupied by a species at the time of its listing that is essential to conservation of the species and may require special management considerations or protection. Areas outside the area occupied by the species may also be listed if the areas are determined to be essential for conservation of the species.

Several fish and aquatic species in Washington are listed under the ESA and have designated critical habitat. Sections 3.2, 3.6, and 3.7 of this PEIS list those species. Because of the number of listed species and because hydraulic projects often include a federal nexus, many hydraulic projects require ESA consultation.

1.5.3 Clean Water Act

The federal Clean Water Act (CWA) is the principal federal law addressing surface water quality. The CWA uses a variety of regulatory and non-regulatory tools to limit direct discharge of pollutants into waterways; finance municipal wastewater treatment facilities; and manage stormwater runoff from streets, construction sites, forests, and farms. These tools are implemented to achieve the overall goal of the act, which is to restore and maintain the chemical, physical, and biological integrity of the navigable waters of the United States so they can support the protection and propagation of shellfish, fish, and wildlife.

Many provisions of the CWA are regulated by the EPA. In some cases EPA has delegated its authority to state agencies: in Washington the authority is delegated to Ecology and seven Tribes. The Corps also implements sections of the CWA. Although WDFW regulates hydraulic projects, it has no authority to administer provisions of the CWA.

The EPA's authority includes discharge of pollutants from a point source into navigable waters regulated through a National Pollutant Discharge Elimination System (NPDES) Permit in accordance with Section 402 of the CWA. NPDES permits also apply to municipal stormwater systems. EPA is also responsible for implementing Section 303 of the CWA, which includes federal water quality standards and provisions for establishing Total Maximum Daily Loads (TMDLs). Section 401 of the CWA requires issuing a Section 401 Water Quality Certification for activities that involve depositing fill or excavating in navigable waters or associated wetlands. The certification states that the project is consistent with federal discharge requirements and the aquatic protection requirement of state law. In Washington State, EPA has delegated its CWA authority to the Department of Ecology, including issuing NPDES permits and Section 401 Water Quality Certification and establishing TMDLs.

Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the U.S., which include wetlands as well as navigable waterways. The Corps implements Section 404 of the CWA.

1.5.4 Forest Practices Act

The Forest Practices Act (FPA) provides for managing public and private commercial forest lands in Washington to balance maintenance of a viable forest products industry with the need to protect natural resource attributes. These attributes include forest soils, fisheries, wildlife, water quantity and quality, air quality, recreation, and scenic beauty (RCW 76.09.010). Forest practices include all practices related to growing, harvesting, and processing timber, including such activities as road construction and

maintenance, thinning, salvage, harvesting, reforestation, brush control, and application of fertilizers and pesticides. The FPA is administered by WDNR through the forest practice rules (Title 222 WAC).

The most recent amendment to the FPA, entitled the Forests and Fish Law, was adopted in 1999. It was developed in response to federal ESA listing of salmon and steelhead and is considered an integral part of the state's salmon recovery strategy. The Forests and Fish Law contains requirements for state lands and private forestland owners to maintain or improve salmon habitat and water quality. Among the provisions of the law are requirements for improved road culverts to facilitate fish passage, enhanced road construction practices to reduce erosion and sedimentation, and enlarged stream buffers to provide better shading. The Forests and Fish Law was also negotiated to assure compliance under the CWA, particularly in light of the many impaired listings (303(d)) on forest lands.

During the 2012 legislative session, 2ESSB 6406 amended the FPA and the Hydraulic Code Rules to integrate fish protection standards contained within the current Hydraulic Code Rules into forest practices rules. All forest practices hydraulic projects (FHPs) are now regulated under forest practices rules.

The amended statutes also require WDFW to adopt rules establishing our own procedures for the concurrence review process. Within this process, WDFW habitat biologists are required to review and provide concurrence or non-concurrence on whether or not FHPs meet specific criteria defined in 2ESSB 6406. The department completed the CR-102 rule-making process in 2013 and these rules were adopted by the director.

2ESSB 6406 states that when WDFW proposes changes to the Hydraulic Code Rules *“that would affect state or private forest landowners and impose restrictions or burdens on forest practices beyond those contemplated in the FFR...”*, WDFW must invoke the adaptive management process as outlined in Appendix M of the Forest and Fish Report. This provides the Forest Practices Policy Committee an opportunity to a review and comment on the proposed new Hydraulic Code Rule as part of the normal rule-making process. Once the HPA rules are adopted by the Fish and Wildlife Commission, the Forest Practices Board must incorporate changes to the FHP fish protection standards into the Forest Practices rules.

1.5.5 Land and Shoreline Use Planning and Management

Land use planning and management in Washington is regulated through local planning and zoning regulations. The 1990 state Growth Management Act (GMA) establishes goals for land use planning and a number of mandatory planning requirements that express the state's interest in local land use planning decisions. The state's fastest growing counties, as well as cities within those counties, are required to prepare comprehensive plans consistent with the goals and mandatory requirements of the act. The provision of the GMA that most relates to hydraulic projects is the requirement that all counties and cities in the state must designate natural resource lands and critical areas within their jurisdiction (RCW 36.70A). Natural resource lands include:

- Agricultural lands that are not already characterized by urban growth and that have long-term significance for the commercial production of food or other agricultural products;

- Forest lands that are not already characterized by urban growth and that have long-term significance for the commercial production of timber; and
- Mineral lands that are not already characterized by urban growth and that have long-term significance for the extraction of minerals.

Critical areas as defined under GMA include:

- Wetlands,
- Areas with critical recharging effect on aquifers used for potable water,
- Fish and wildlife habitat conservation areas,
- Frequently flooded areas, and
- Geologically hazardous area.

The GMA requires that all counties and cities adopt development regulations to ensure conservation of natural resource lands and the protection of critical areas (RCW 36.70A.060). Counties and cities must give special consideration to conservation or protection measures needed to preserve or enhance anadromous fisheries. Typical protection measures include restricting types of development in critical areas and provisions for wetland and stream buffers to protect riparian areas.

Shorelines of the state are protected by the Shoreline Management Act (SMA) of 1971 (Chapter 90.58 RCW). The SMA applies to the following classes of waters of the state:

- All marine waters of the state,
- Streams and rivers with a mean annual flow of 20 cubic feet per second (cfs) or more,
- Lakes and reservoirs larger than 20 acres in area, and
- Wetlands and floodplains associated with the above.

The SMA also applies to upland areas extending landward for 200 feet of the ordinary high water mark (OHWM). The SMA requires cities and counties to adopt Shoreline Management Plans (SMP) that meet the requirements of its administrative rules, which were last updated in 2003 (Chapter 173-26 WAC). The new administrative rules include requirements for such hydraulic projects as shoreline stabilization; piers and docks, fill, breakwaters, jetties, groins, and weirs; dredging and dredge material disposal; and shoreline habitat and natural systems enhancement projects.

The SMA exempts public and private projects that are designed to improve fish and wildlife habitat or fish passage from the requirement to obtain a shoreline substantial development permit, if all of the following conditions are met:

- The project has been approved by WDFW;
- The project has received an HPA from WDFW; and
- The local government has determined that the project is substantially consistent with the local shoreline master program (RCW 90.58.147).

1.5.6 Cultural Resources

The State Department of Archaeology and Historic Preservation (DAHP) works with project proponents to ensure compliance with various cultural resource regulations, including Section 106 of the National Historic Preservation Act (NHPA) and the Governor's Executive Order 05-05. The NHPA requires all

projects with federal funding to identify cultural resources and obtain an opinion from DAHP on the site's significance and the impact of the project on the site. Governor's Executive Order 05-05 requires that state agencies integrate DAHP and tribes into their capital planning processes in order to protect cultural sites. Federal and state laws, including the Archaeological Resource Protection Act of 1979, Archaeological and Historic Preservation Act of 1974, Executive Order 05-05, RCW 27.44 Archaeological Sites and Resources, WAC 25-48 Archaeological Excavation and Removal Permit, and WAC 25-46 Registration of Historic Archaeological Resources on State-Owned Aquatic Lands, protect archaeological sites if inadvertently disturbed by construction activities. Hydraulic projects often include excavation and other ground-disturbing activities in riparian and marine areas, which have a higher likelihood of presence of historic and cultural resources. Thus, it is important that projects receiving hydraulic project approval from WDFW comply with regulations that protect cultural resources..

1.5.7 Role of the Hydraulic Code Authority

Local, state, and federal agencies may have jurisdiction over the same project. At each jurisdictional level, priorities and legal mandates determine the resources protected and the extent of the protection that is applied. Mitigation requirements also vary according to the agencies' protection priorities and legal mandates. As a result, regulatory efforts may share intentions or have entirely different habitat protection objectives. The Governor's Office of Regulatory Innovation and Assistance has prepared an [aquatic permitting spreadsheet](#)¹ summarizing the types of permits required from local, state, and federal jurisdictions. The spreadsheet includes the purpose of the permit, the type of activity that triggers the permit, timeline, and agency contact information.

The HPA fills a unique niche because it is the only permit issued solely to protect fish life. In many cases, the HPA is the only permit required for hydraulic projects in streams too small to be considered a shoreline of the state or navigable waters. These projects do not undergo a Critical Area Ordinance review because a shoreline or other land use application is not required by the local government. For hydraulic projects that receive a Shoreline Substantial Development Permit Exemption (SSDE) often the only permitting requirement is to obtain an HPA and perhaps a Department of Army Permit.

Ranching, farming, and silviculture activities are exempt from a Department of Army Section 404 permit. If the hydraulic project requires a Department of Army permit (Section 404 or Section 10) often the Corps will not make a final permit decision until local or state permits, including the HPA, are issued. If the hydraulic project requires a Department of Army permit, a Section 401 water quality certification is also required. In many cases, an HPA must be obtained before a Department of Ecology Section 401 certification is issued. However, this is not the case for many of the Nationwide Permits that have a pre-approved Section 401 Water Quality Certification. The Corps issues nationwide permits for fifty types of projects that are similar in nature and have minimal individual or cumulative impacts. To receive a nationwide permit, hydraulic projects must comply with the General Conditions listed in the document.² Usually the provisions in an HPA are more specific to the construction of a hydraulic project than the

¹ Aquatic Permitting Spreadsheet is available at www.ora.wa.gov/documents/ENV_011_08.pdf

² User's Guide for Nationwide Permit in Washington State is available at <http://www.nws.usace.army.mil/Portals/27/docs/regulatory/NWPs/2012%20NWP%20Users%20Guide.pdf>

general conditions in a nationwide permit. As a result, the HPA provides added fish protection especially for non-ESA-listed state priority fish and shellfish species.

In accordance with Section 7 of the ESA, the Corps must consult with the Services on any work proposed in an application including nationwide permits that may affect an ESA-listed species or its designated critical habitat. The Services will provide the Corps with conservation measures to protect federally listed fish species. However, the Services do not recommend conservation measures to the Corps to protect other state priority fish and shellfish species and their habitats. This is the unique purpose of the HPA.

1.6 Stakeholder and Public Involvement

WDFW has involved the public and stakeholders in developing the updated Hydraulic Code Rules. WDFW formed a Stakeholder Advisory Group to provide comments on an initial draft of the HPA rules. This group included eighteen representatives from the construction industry, non-governmental organizations, state and federal agencies, and tribes. This group met eight times between October 31 and the end of December, 2011, receiving presentations on and discussing issues relating to one or two specific aspects of the HPA rules at each meeting. The group engaged in policy discussions about the proposed changes and the impacts to their interests, and commented on revised rule proposals prepared by WDFW. Those rule documents were also posted on the WDFW web site for comment by any reader. Three separate drafts of the revised code rules have been posted on the WDFW website along with forms to comment on the rules. The fourth draft accompanied the September 2013 PEIS. A final draft accompanies this supplemental draft PEIS. This draft was revised based on September 2013 PEIS comments and will be finalized concurrent with the final EIS. The Fish and Wildlife Commission will consider the final draft rules and hear public testimony prior to adopting final rules in fall of 2014.

WDFW conducted a public scoping process for this EIS in summer 2012. The scoping notice was issued June 22, 2012 and the scoping comment period ended July 16, 2012. Scoping comments were accepted by email, through an online WDFW comment website, by fax, and by mail. WDFW received thirty-one comment documents. Generally, comments provided detailed suggestions for how rule changes should address specific problems or situations, or ways the proposals should not be changed from existing rules. Few commenters stated a preference among the alternatives presented, although a leaning towards the preferred alternative was deduced from the overall tone of the comments provided. A more detailed summary of the scoping comments is provided in Appendix A.

WDFW has met one-on-one with Tribes and interested stakeholders to discuss the rule update on an ad-hoc basis since the CR-101 was filed in 2011. Stakeholders include Washington Association of Counties, Association of Washington Cities, Association of Washington Business, Washington Forest Protection Association, Ports Association, Washington Department of Transportation, Ecology, and WDNR, and the environmental community. WDFW also conducted seven public meetings, one in each of the six regions and one in Olympia, in October and November 2013. The purpose of the meetings was to answer questions and gather comment on the PEIS and draft rules.

1.7 How to Read this Document

This EIS is organized into six chapters:

- Chapter 1 provides background information on the Hydraulic Code Rules update process; the purpose and need for the action; summary of comments on the Supplemental Draft PEIS, statutory authority, related permits, actions, and laws; and a description of public involvement.
- Chapter 2 presents a description of the No Action Alternative, Proposed Rule Changes Alternative, and two alternatives that reflect public comments. These alternatives are entitled “Additional Protection for the Natural Environment” and “Additional Protection for the Built Environment.” The chapter also summarizes how the alternatives were developed and describes alternatives eliminated from detailed evaluation.
- Chapter 3 describes the affected environment and existing conditions.
- Chapter 4 describes the potential impacts and benefits of the four alternatives.
- Chapter 5 lists the references used in compiling this EIS.

Chapter 2 Alternatives

The purpose of the action is to update the Hydraulic Code Rules for consistency with changes to the statute, to adequately reflect evolving fish science, and to incorporate improved project design and construction technology. The diversity of tribal, stakeholder, and public concerns and interests makes it challenging to develop comprehensive rule changes that meet the purpose and need of this project. The Supplemental Draft PEIS evaluates four alternatives for changes to the Hydraulic Code Rules: Alternative 1 - No Action, consisting of the Current Rules; Alternative 2 – WDFW-proposed rule changes (preferred alternative); Alternative 3 - Increased Protection of Fish Life, which includes more restrictions to protect fish life; and Alternative 4 - Increased Protection for the Built Environment, which reduces restrictions in order to reduce project costs.

Alternative 2 (WDFW-proposed rule changes) is preferred for many reasons. This alternative represents over six years of work by WDFW and tribal/stakeholder representatives, including one-on-one and group discussions, and four rounds of draft rule review. Alternative 2 tries to balance all those competing needs and also improves alignment with the current statute. Alternatives 3 and 4 are included for Fish and Wildlife Commission consideration because they reflect the diverse array of public comments about the appropriate level of fish protection/restrictions the rules should impose on hydraulic projects.

This chapter describes the four alternatives and the process used to formulate the alternatives and includes tables that compare the alternatives. This chapter also discusses alternatives that were considered but eliminated from further study.

2.1 Formulation of Alternatives

As described in Chapter 1, WDFW began to revise the Hydraulic Code Rules in 2006 as part of developing a Habitat Conservation Plan (HCP) to provide long-term certainty of ESA compliance related to agency permitting action. Although work on the HCP ended in 2012, WDFW has remained committed to moving forward to improve HPA rules to incorporate more current scientific and technical knowledge to better protect fish life, to increase certainty for applicants, and to streamline the HPA approval process.

The Stakeholder Advisory Group assembled by WDFW provided input on how to balance protection of fish with economic impacts. The group reviewed a first draft of the revised rules in late 2011. The rule revisions evaluated in this Supplemental Draft PEIS incorporate comments from the advisory group and other public, tribal, and stakeholders on the subsequent second, third, and fourth drafts.

WDFW's participation in the *Lean Process* led to procedural improvements to HPA application processing and efficiency of implementing the Hydraulic Code Rules. The *Lean Process* is an internal review process used throughout state government to deliver essential services with innovation, efficiency, and integrity. The *Lean Process* uses a standard set of principles, methods, and tools to identify efficiencies. HPA system upgrades and efficiencies will allow WDFW staff to provide applicants with up-front and on-the-ground assistance before and during project development.

2.1.1 Bringing Hydraulic Code Rules Up To Date

Several changes to hydraulic code statutes have occurred since the last comprehensive hydraulic code rule update in 1994 (Table 2-1). In some cases, current rules are incomplete with respect to current statute. As stated in Chapter 1, updating the rules to better align with current statute is one important purpose for the hydraulic code rules update.

In addition, new information about the impacts of hydraulic projects on fish life and habitat has become available since the last rule update, and technology to address those impacts has advanced significantly. The proposed action to update the hydraulic code rules is intended to take advantage of that information and those advances.

Finally, the organization of the existing rules is not user friendly because procedural information and information relevant to a particular project type appears in several different sections. The proposed revision reorganizes the rules to follow a logical progression and to consolidate rules for each project type.

2.1.1.1 Statute and Rules

The state Legislature gave the department the responsibility to preserve, protect, and perpetuate all fish and shellfish resources of the state. To help achieve that goal, the Legislature passed a state law in 1943 called *Protection of Fish Life*. The law (now recorded in state statute, the *Revised Code of Washington*, as Chapter 77.55 RCW) has been amended since it was originally enacted; however, the basic authority has been retained. Now titled *Construction projects in state waters*, the law can be accessed at: apps.leg.wa.gov/RCW/default.aspx?cite=77.55).

The RCW also gives state agencies the authority to issue regulations to administer state laws. These regulations (the Washington Administrative Code, or WAC) represent the most fundamental level of legal requirement in Washington State. The WAC codifies these regulations and arranges them by subject and agency. Chapter 220-110 WAC *Hydraulic code rules* establishes regulations for administration of the permit program involving construction of hydraulic projects or performance of other work that will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state. The WAC also sets forth procedures for obtaining an HPA. This WAC chapter incorporates criteria generally used by WDFW to review and condition hydraulic projects so they are protective of fish life.

Table 2-1 details the changes to this statute since the last hydraulic code rule update in 1994. Table 2-7 details recommended rule changes received from commenters that can't be implemented by the Fish and Wildlife Commission because they are inconsistent with current statute.

Table 2-1 Changes to Hydraulic Code Statutes since 1994

Year	Bill No.	Current RCW	Topic	Changes
1995	SB 5633	77.55.081	Aquatic Plant control	The Hydraulic Code (then RCW 75.20) was amended to exempt activities conducted solely for the removal or control of spartina and the removal or control of purple loosestrife by handheld tools or equipment from the need of an HPA. The bill further instructs the department to develop a pamphlet describing means of removing or controlling aquatic noxious weeds that fall under the authority of the Hydraulic Code for which no formal HPA is required – the pamphlet serving as the department’s permit.
1995	ESSB 5616	77.55.171	Watershed restoration projects — Permit processing	A new section was added to the Hydraulic Code (currently RCW 77.55.171) specifically directing the department to process applications for qualified restoration projects in compliance with the act, codified as RCW 89.08.450 through 89.08.510.
1995	ESHB 2793	77.55.191	Columbia R. anadromous fish sanctuary	This statute implements Referendum 45 by shifting the responsibility of the director relative to the Columbia River anadromous fish sanctuary to duties of the Fish and Wildlife Commission.
1996	SHB 2167	77.55.151	Permit issued to a marina or marine terminal for regular maintenance activities	2167 (1996) and 2866 (2002), taken together, affirm that regular maintenance activities for marinas and marine terminals should be covered by a renewable five-year HPA. SHB 2167 initially provided for the above for marinas; ESHB 2866 added marine terminals. “Marina” and “marine terminal” are defined.
1996	SB 6305	77.55.241,301	Off-site mitigation	This statute acknowledges that hydraulic projects might require mitigation and that such mitigation might be most beneficial if applied in locations away from the project site. The statute also provides that if an applicant proposes off-site mitigation, and the department either does not approve it or conditions it such that it is impractical, the applicant may submit the permit application to the Hydraulic Appeals Board for approval.
1997	SSB 5442	77.55.021(8),(10)	Expediting repairs during flooding emergency	This statute provides that the county legislative authority as well as the department may declare an emergency or imminent danger.
1997	SHB 1565	77.55.091	Small scale prospecting and mining	This statute directs the department to, by June 30, 1997, and in cooperation with recreational miners and other interested parties, develop

Year	Bill No.	Current RCW	Topic	Changes
				rules for small scale prospecting and mining and incorporate them into an updated Gold and Fish pamphlet. The pamphlet update was completed, and then revised in 2009.
1997	E2SHB 1866	77.55.101	Environmental excellence program	This statute directs agencies to “solicit and support” development of environmental excellence program agreements that use innovative environmental measures or strategies to achieve environmental results more effectively or efficiently than traditional methods. Such agreements would then not be subject to the environmental standards and other features of the environmental regulations that otherwise would be applied by the agreeing agency(ies). Details of such agreements are specified. It also provides that the terms and provisions of an environmental excellence program agreement under chapter RCW 43.21K supersede any standard, limitation, rule, or order of the Hydraulic Code.
1997	SSB 5327	77.55.111,121	Habitat incentives program	That portion of the act currently codified as RCW 77.55.111 provides that when evaluating an application for an HPA from an applicant who has entered into a habitat incentives agreement, the department must comply with the terms of that agreement. That portion codified as RCW 75.55.121 provides that the department and DNR shall implement a habitat incentives program to allow private landowners to enhance fish or wildlife habitat on their property and receive state regulatory certainty that future decisions relative to HPA applications will be based on the conditions present on the landowner’s property at the time of the agreement.
1997	ESSB 5273	77.55.251	Mitigation plan review; Compensatory mitigation for aquatic resources	This act finds that the state lacks a clear policy for mitigation of wetlands and aquatic habitat for infrastructure projects (e.g., highways, rail lines, utility corridors, and hydroelectric facilities). It requires state regulatory agencies to consider alternative mitigation proposals for infrastructure projects that are timed, designed, and located in a manner so as to provide equal or better biological functions and values as compared to traditional on-site, in-kind mitigation. The Act further provides procedures for project proponents to propose mitigation plans for compensatory mitigation within a watershed that

Year	Bill No.	Current RCW	Topic	Changes
				<p>guarantee long-term viability of biological functions and values, provide for long-term monitoring, and are consistent with an approved planning process. The Act provides that the department and Ecology may not require mitigation be on or near the project site if the proposed plan provides equal or better biological functions and values within the watershed or bay as compared to existing conditions for the target resources or species identified in the mitigation plan; it also lists the factors upon which this review is to be based. The plan is to be approved through Memoranda of Agreement with either the WDFW or Ecology.</p> <p>The Act further provides that, upon request, the department and Ecology must follow the guidance provided in this act for review of mitigation proposals. It also provides that if there are multiple requests for such mitigation proposal review, the departments may each schedule review to conform to available budgets.</p> <p>The Act is codified as Sections 90.74.005 through 90.74.030 and 75.55.251 RCW.</p>
1997	ESSB 5273	77.55.271	Sediment capping and dredging and navigation and maintenance dredging	<p>Section 5 of this act provides that the department may not require mitigation for sediment dredging or capping actions that result in a cleaner aquatic environment and equal or better habitat functions and values if the actions are taken under a state or federal cleanup action. It also provides that the act is not to be construed to require habitat mitigation for navigation and maintenance dredging of existing channels and berthing areas. This section is codified as RCW 77.55.271.</p>
1998	ESSB 6328	77.15.300,310,320	Fish and wildlife enforcement code	<p>This statute eliminates from what is now codified as RCW 77.57.010 (requiring that water diversions be screened) the provision that “it is unlawful to fail to comply with the section”. Similarly, it eliminates from what is now RCW 77.57.030 (requiring that a dam or other stream obstruction be equipped with a fishway) a similar provision. It also eliminates from what is now RCW 77.55.021 provisions that working without an HPA or failure to follow permit conditions is a gross misdemeanor and subject to abatement.</p> <p>It further amends the Columbia River anadromous fish sanctuary section</p>

Year	Bill No.	Current RCW	Topic	Changes
				(now RCW 77.55.191): (1) previously it was stated that it is unlawful to construct a dam greater than twenty-five feet high within the sanctuary. As amended, the department shall not issue an HPA to construct a dam greater than twenty-five feet high. (2) Previously, except by order of the Commission, a person was precluded from diverting water from the rivers and streams in quantities to reduce the flow below the annual average low flow. As amended, a person shall not do so (but the order is not required).
1998	SSHB 2879	77.55.181	Fish habitat enhancement project — Permit review and approval process	This statute provides a streamlined process for reviewing fish habitat enhancement projects submitted on a JARPA form that meets certain described conditions, including size or threshold tests. Within 45 days, the department must issue an HPA either with or without conditions, deny approval, or make a determination that the project does not meet all the conditions for streamlined review. Local governments are notified of the project, have 15 days to comment, and are precluded from requiring permits or charging fees. Any person aggrieved by a permit decision may appeal to the Hydraulic Appeals Board. The statute identifies eligibility requirements. The department is directed to develop size or scale threshold tests to evaluate if the scale of the project raises concerns regarding public health and safety. Further, the department is directed to continue to improve the permitting review and approval process.
2000	ESHB 2078	77.55 RCW	Fish and Wildlife	Combined HPA statutes for Departments of Wildlife and Fisheries from Title 75 to Title 77 RCW into one code; No substantive changes
2001	SSB 5961	77.55.181	Fish habitat enhancement project — Permit review and approval process	Technical corrections only to reflect a change from Title 75 to Title 77 RCW.
2002	ESHB 2866	77.55.021 & .231	Minor modifications to plans/work timing	ESHB 2866 further provides that an HPA must contain provisions allowing for minor modification to plans and specifications without requiring reissuance of the HPA (or an additional fee).

Year	Bill No.	Current RCW	Topic	Changes
2002	ESHB 2866	77.55.231	HPAs must be reasonably conditioned	Ch. 77.55 RCW had an existing provision that approvals shall not be unreasonably withheld. With ESHB 2866, the legislature finds that hydraulic project approvals should ensure that fish life is properly protected, but conditions attached to the approval of these permits must reasonably relate to the potential harm that the projects may produce. This part of ESHB 2866, now codified as RCW 77.55.231, provides that conditions must be “reasonably related to the project” and that “the department may not impose conditions that attempt to optimize conditions for fish life that are out of proportion to the impact of the proposed project.”
2002	ESHB 2866	77.55.151	Permit issued to a marina or marine terminal for regular maintenance activities	ESHB 2866 added marine terminals to provisions earlier adopted for marina maintenance (1996 SHB2167).
2002	ESHB 2866	77.55.161	Storm water discharges	ESHB 2866 also restricts department authority with respect to issuing HPAs for storm water projects. If the project is in an area covered by a National Pollution Discharge Elimination System (NPDES) municipal general permit, an HPA is required only for the actual construction of the outfall and any associated structures. Secondary impacts from the discharge may not be addressed in HPA permitting. In areas not covered by a NPDES municipal general permit, the department may additionally condition HPAs with respect to discharge rates to protect fish life from the direct hydraulic impacts of the discharge under certain conditions. The department may not require changes to the project design above the ordinary high water line. The department may recommend but not specify the measures required to meet prescribed discharge rates.
2002	SSB 6513	77.55.041	Derelict fishing, crab, and other shellfish gear — Removal	This law exempts from provisions of the Hydraulic Code the removal of derelict fishing gear if removed according to guidelines that the department is directed to develop in conjunction with the DNR and the Northwest Straits Commission. These guidelines have been developed.
2002	ESSB 6594	77.55.071	Siting secure transition facilities	Expired 6/30/2009

Year	Bill No.	Current RCW	Topic	Changes
2003	E2SHB 1418	77.55.281	Fishways on certain agricultural drainage facilities	<p>RCW 77.57.030 requires that dams or other obstructions across or in a stream be provided with a fishway. Section 1 of E2SHB 1418 defines “other obstructions” to exclude “tide gates, flood gates, and associated man-made agricultural drainage facilities that were originally installed as part of an agricultural drainage system on or before May 20, 2003, or the repair, replacement, or improvement of such tide gates or flood gates.”</p> <p>Section 2 of the Act precludes the department from requiring, as a condition of an HPA, a fishway on a tide gate, flood gate, or other associated man-made agricultural drainage facility if such fishway was not originally installed as part of an agricultural drainage system existing on or before the effective date of the section.</p> <p>Section 2 further provides that “any condition requiring a self-regulating tide gate to achieve fish passage in an existing hydraulic project approval under this section may not be enforced.”</p> <p>The law also directs the Fish and Wildlife Commission and county legislative authorities to form a task force to develop a plan that addresses intertidal habitat goals contained in a limiting factors analysis for specific geographic areas. The process is underway in Skagit County.</p>
2003	ESSB 5776	77.55.301	Hydraulic Appeals Board	<p>This law reforms the process of appeal and review of final permit decisions made by state agencies and local governments for qualifying economic development projects. What is now RCW 77.55.301(6) was amended such that any person aggrieved by a permit decision under RCW 77.55.021 may appeal to the Office of Administrative Hearings or Hydraulic Appeals Board (HAB). However, the newly formed Environmental and Land Use Hearings Board hears qualifying economic development projects, in accordance with RCW 43.21L.</p>
2005	2SHB 1346	77.55 & 77.57 RCW	RCW 77.55 reorganized and recodified	<p>This act reorganizes and re-codifies the Hydraulic Code (77.55 RCW) and moves the statutes regarding fishways and stream obstructions to a separate chapter (RCW 77.57)</p>
2005	2SHB 1346	77.55.201	Landscape management plan	<p>2SHB 1346 provides that a landscape management plan approved by WDFW and DNR under RCW 76.09.350(2) shall serve as a permit for the life of the plan if fish are selected as one of the public resources for coverage</p>

Year	Bill No.	Current RCW	Topic	Changes
				under such a plan.
2005	2SHB 1346	77.55.211	Informational brochure	WDFW, Ecology, and DNR were directed by 2SHB 1346 to jointly develop an informational brochure that describes when permits and any other authorizations are required for flood damage prevention and reduction projects, and recommends ways to best proceed through the various regulatory permitting processes.
2005	2SHB 1346	77.55.221	Flood damage repair and reduction activities — Five-year maintenance permit agreements	2SHB 1346 further directs WDFW to, at the request of a county, develop five-year maintenance permit agreements (“General permits”), consistent with comprehensive flood control management plans adopted under the authority of RCW 86.12.200, or other watershed plan approved by a county legislative authority, to allow for work on public and private property for bank stabilization, bridge repair, removal of sandbars and debris, channel maintenance, and other flood damage repair and reduction activity under agreed-upon conditions and times without obtaining permits for specific projects.
2008	SHB 2525	77.55.021	Chronic Danger HPA	Established a Chronic Danger HPA and directs WDFW to review using the Habitat Restoration Project criteria. County declares “Chronic Danger” if flooding has impacted property, structures, water supply system, septic system, or access to roads due to flooding for two consecutive years. Property located on a marine shoreline is not included under this provision. In cases of chronic danger, WDFW is directed to issue a permit, upon request, for work necessary to abate the chronic danger by removing any obstructions, repairing existing structures, restoring banks, restoring road or highway access, protecting fish resources, or protecting property. Permit requests are subject to the review process established in RCW 77.55.181(3) as if it were a fish habitat improvement project.
2012	2SHB 1346	77.55.151	Defines regular maintenance activities	2SHB 1346 made changes to several programs that provide for the protection of the state's natural resources. Relative to the Hydraulic code, definitions for Emergency, Expedited, Multiple site, Forest Practices, and Pamphlet HPAs were added, along with the provisions to implement them. The Act also defines regular maintenance activities for marinas or marine terminals.

Year	Bill No.	Current RCW	Topic	Changes
2012	E2SSB 6406	77.55.231	Application fee for a hydraulic project permit or permit modification — Projects exempt from fees — Disposition of fees. (Conditions reasonably related was in 2002, see SSB 6513)	E2SSB 6406 adds an HPA application fee and the mechanisms necessary to implement the fee.
2012	E2SSB 6406	77.55.331	Hydraulic project approval account	This is an element necessary to implement the HPA application fee.
2012	E2SSB 6406	77.55.341	Department to prepare and distribute information to the public	E2SSB 6406 directed WDFW to prepare and distribute technical and educational information to the general public to assist the public in complying with the requirements of this chapter.
2012	E2SSB 6406	77.55.351	Department to develop system to provide access to hydraulic project approval applications	E2SSB 6406 directed WDFW to develop a system to provide local governments, affected tribes, and other interested parties with access to hydraulic project approval applications. Led to development of the new online application and review system "APPS"
2012	E2SSB 6406	77.55.361	Limitations of chapter to a forest practices hydraulic project — Adoption of rules for concurrent review process — Department's duties regarding chapter 76.09 RCW	E2SSB 6406 directed WDFW and DNR to integrate the current HPA requirements for Forest Practices HPAs with the Forest Practices Rules administered by the DNR Forest Practices Board. Once integration has occurred, WDFW is permitted (“may”) review and provide comments on any forest practices application (“concurrence review”). Special timelines are applied to DNR’s approval (or disapproval) of a forest practices application that is subject to WDFW concurrence review.
2012	E2SSB 6406	77.55.371	Memorandum of agreement to implement integration of hydraulic project approvals into forest practices applications — Interagency contract	E2SSB 6406 also directed WDFW and DNR to enter into and maintain a memorandum of agreement between the two agencies that describes how to implement integration of hydraulic project approvals into forest practices applications per HPA/FPA integration.

2.1.1.2 Science Supporting the Proposed Alternative

Beginning in 1999, WDFW has reviewed over 1,900 peer-reviewed journal articles, books, symposia literature, theses/dissertations, and technical reports for information applicable to hydraulic projects. Most of the literature is incorporated into the Aquatic Habitat Guidelines (AHG) Program documents and consolidated into White Papers associated with AHG and HCP development. Because the most recent compilation of information was completed in 2008, WDFW conducted additional review of literature available after 2008 and incorporated the relevant information into the proposed rule changes. The supporting list of science references includes both the original compilation work as well as incorporation of literature made available between 2008 and development of the proposed rules. The list of scientific references can be found on the WDFW web site.

2.1.1.3 Aquatic Habitat Guidelines (AHG) Program Documents

In 1999, the Washington State Departments of Fish and Wildlife (WDFW), Ecology (Ecology), and Transportation (WSDOT) were asked to develop guidelines using an integrated approach to marine, freshwater, and riparian habitat protection and restoration. In 2001, the United States Army Corps of Engineers (ACOE) and the United States Fish and Wildlife Service (USFWS) became participating agencies in the program. The AHG steering committee includes technical and science experts from each of these agencies, as well as representatives from Washington Department of Natural Resources (DNR) and the Recreation and Conservation Office (RCO). The overarching goal of the AHG program is to develop technical assistance for proper management of activities affecting Washington's marine, freshwater, and riparian ecosystems so that fully functioning aquatic and riparian habitat can be protected and restored. The AHG Program provides technical assistance that shows people how to apply the best science and technology to design and construct several types of hydraulic projects. AHGs do not replace existing regulatory requirements; they are intended to provide technical guidance supporting regulatory consistency.

The Guidelines produced by the AHG program were issued in a series of manuals written by professional resource engineers and managers addressing many aspects of aquatic and riparian habitat protection and restoration. The target audiences include local, state, and federal agencies; elected officials; engineering consultants and designers; volunteer restoration groups; and landowners. The Guidelines facilitate the consistent application of best science and good practices for project designs, construction, and operations affecting aquatic systems.

The Guidelines include surveys of background science and literature; summary of policy and regulatory issues; site and vicinity environmental assessment procedures; project design processes, standards, and details; and case studies that highlight site-specific issues. As such, the Guidelines address ecosystem-based strategies for aquatic and riparian habitat restoration and protection. The Guidelines are intended to support salmon and other aquatic habitat restoration projects, facilitate consistency in permitting of habitat restoration projects and other in-stream projects across the state, and provide a scientific basis for any future changes to current policies or regulations governing aquatic resource and habitat management in the state. AHG guidelines completed since 1999 are listed in Table 2-2.

2.1.1.4 “White Papers”

AHG documents are based on a survey of current best science and technical practices, called “white papers.” White papers are agency documents developed to compile current technology and information gleaned from a thorough review of literature on impacts to fish life from common hydraulic project types and ways to prevent or mitigate those impacts.

The white papers were written by recognized experts and built on a set of guiding principles developed by professional resource managers, engineers, and other practitioners (Nelson and Bates 2000). White papers were initially prepared to support development of the AHG, and were adapted to support development of an HCP for the HPA program. Although the papers focused on impacts to ESA-listed fish life, the white papers provide a solid scientific foundation upon which to improve the rules for protecting fish life in general. The objectives of the HCP white papers were to:

- Compile the best available scientific information related to potential impacts on fish, their habitats, and associated ecological processes resulting from constructing, operating, and maintaining fish passage structures.
- Use this scientific information to estimate the circumstances, mechanisms, and risks of harm potentially or likely to result from constructing hydraulic projects.
- Identify appropriate and practicable measures, including policy directives, conservation measures, and best management practices (BMPs), to avoid and/or minimize the risk of harm to fish life.

Five principal tasks were performed in preparing the white papers:

1. Existing WDFW rules and guidance were reviewed to identify current knowledge and practices relating to analyzing the impacts to fish life associated with HPA-permitted activities.
2. A literature review was conducted to compile information reflecting the current state of knowledge of potential impacts to fish life associated with HPA-permitted activities.
3. The compiled documents were reviewed to determine which potential pathways of impact were addressed in each document. Most of the collected documents considered impacts to salmonids or to physical habitat features, although some documents identified impacts to other fish life and their habitats.
4. Impact mechanism analyses were prepared for each of the principal impact pathways and for each principal type of HPA-permitted activity.
5. A draft version of the white paper was prepared and reviewed by technical specialists on the consultant team, then submitted to WDFW for comments. The white paper was amended based on the comments and the white paper was finalized.³

White papers compiled in support of the AHG are listed in Table 2-3.

³ In some cases, white papers were not finalized because agency work leading to finalization was re-prioritized. Information provided in the white papers was used to develop AHG guidelines and recommendations regardless of the “draft” or “final” status of the white paper.

Table 2-2 Aquatic Habitat Guidelines Documents

Document Citation	Summary	Related HPA Activities	Category
<p>Marine Shoreline Design Guidelines, 2014, by Johannessen, J., A. MacLennan, A. Blue, J. Waggoner, S. Williams, W. Gerstel, R. Barnard, R. Carman, and H. Shipman (WDFW) (available at wdfw.wa.gov/publications/01583/)</p>	<p>These guidelines are specific to shore armor – the construction of bulkheads and seawalls in Puget Sound. Created to inform responsible management of Puget Sound shores for the benefit of landowners and shared natural resources. Provides a comprehensive framework for site assessment and alternatives analysis to determine the need for shore protection and identify the technique that best suits the conditions at a given site. For use by project designers, planners, contractors, and landowners.</p>	<ul style="list-style-type: none"> • Common saltwater construction provisions • Bank protection in saltwater areas 	<p>External peer review</p>
<p>Water Crossing Design Guidelines (formerly Design of road culverts for fish passage), 2013, prepared by Bob Barnard, Ken Bates, Bruce Heiner, Pat Klavas, Don Ponder, Pad Smith and Pat Powers (WDFW) (available at wdfw.wa.gov/publications/01501/)</p>	<p>This document promotes water crossing selection and design process intended to have the least effect on the natural processes that create and support the stream structure in which fish live and migrate. The geomorphic approach to design is generally based on readily-measured characteristics of the natural channel in the adjacent reaches. Five different water crossing design methods are covered including no-slope culverts, stream simulation culverts, bridges, temporary culverts, and hydraulic design fishways.</p>	<ul style="list-style-type: none"> • Common freshwater construction requirements • Water crossing structures • Fish passage improvement structures 	<p>External peer review</p>
<p>Stream Habitat Restoration Guidelines, 2012, by Michelle Cramer (WDFW) (available at wdfw.wa.gov/publications/01374/)</p>	<p>This document includes design criteria and practical considerations for the design of stream restoration projects including site, reach, and watershed assessment, problem identification, general approaches to restoring stream and riparian habitat, factors to consider in identifying and selecting an approach, approaches to solving common restoration objectives, and stream and riparian habitat restoration techniques. Watershed processes and conditions that shape stream channels, stream ecology, geomorphology, hydrology, hydraulics, planting considerations and erosion control, and construction considerations are also presented in the main text and appendices.</p>	<ul style="list-style-type: none"> • Channel relocation and realignment • Large woody material placement, repositioning, and removal in freshwater areas 	<p>External peer review</p>
<p>Integrated Streambank Protection Guidelines (ISPG), 2003, prepared by Michelle Cramer, P.E., and Ken Bates, P.E (WDFW) and Dale Miller; Karin Boyd; Lisa Fotherby, Ph.D., P.E.; Peter Skidmore and Todd Hoitsma, (Inter-Fluve, Inc.) (available at wdfw.wa.gov/publications/00046/)</p>	<p>This document includes design considerations for integrated stream bank protection: mechanisms and causes of failure (general bank erosion, scour, avulsion, mass failure, subsurface entrainment), shear, vertical distribution of shear, habitat, risk, site- and reach-based assessment, channel form, channel process (equilibrium and disequilibrium). Mitigation considerations: duration and extent of impacts (construction, lost habitat, etc.), lost opportunity, emergency bank protection. Project design includes decision-making matrices for selecting appropriate solutions.</p>	<ul style="list-style-type: none"> • Common freshwater construction requirements • Streambank protection and lake shoreline stabilization 	<p>External peer review</p>
<p>Protecting Nearshore Habitat and Functions in Puget Sound, June 2010 Revised Edition, by EnviroVision, Herrera Environmental, and Aquatic Habitat Guidelines Working Group (available at wdfw.wa.gov/publications/00047/)</p>	<p>This document is specific to shoreline modifications - a variety of structures and activities intended to adapt the shoreline environment for human use. Summarizes current science on important nearshore habitats and processes, data and recommendations to support avoidance and minimization of impacts and mitigating cumulative impacts.</p>	<ul style="list-style-type: none"> • Common saltwater construction provisions • Bank protection in saltwater areas • Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in saltwater areas 	<p>External peer review</p>

Document Citation	Summary	Related HPA Activities	Category
<p>Land Use Planning for Salmon, Steelhead and Trout: A land use planner’s guide to salmonid habitat protection and recovery, October 2009, by Katie Knight (available at wdfw.wa.gov/publications/00033/)</p>	<p>This document provides guidance for protecting salmon habitat through GMA and SMA plans and regulations. Document translates current best available science into planning tools, including model policies and regulations to protect salmonids and prevent further degradation or loss of habitat. For use by land use planners of local jurisdictions.</p>	<ul style="list-style-type: none"> • Freshwater habitats of special concern • Common freshwater construction provisions • Large woody material placement, repositioning, and removal in freshwater areas • Channel relocation and realignment • Water crossings • Saltwater habitats of special concern • Common saltwater construction provisions • Streambank protection and lake shoreline stabilization • Bank protection in saltwater areas • Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in saltwater areas 	<p>External peer review</p>
<p>Fishway Guidelines for Washington State (draft), 2000, prepared by Ken Bates (WDFW) (available at wdfw.wa.gov/publications/00048/)</p>	<p>This document includes pre-design data requirements and considerations, design considerations for fishway entrances (entrance pool and transportation channel design), auxiliary water systems (diffuser and water supply source), fish ladders (pool and weir fishways, vertical slot fishways, roughened channels, hybrid fishways), fishway exit, tributary fish passage, upstream juvenile fish passage, flap gates, fishway flow control. Design considerations: types and applications of screen styles (drums, fixed plate, traveling, pump screens, infiltration galleries), screen design criteria, hydraulic design, fish bypass systems, debris management.</p>	<ul style="list-style-type: none"> • Fish passage improvement structures 	<p>External peer review</p>
<p>Fish Protection Screen Guidelines for Washington State (draft), 2000, by Ken Bates (WDFW) and Bryan Nordlund (NMFS) (available at wdfw.wa.gov/publications/00050/wdfw00050.pdf)</p>	<p>This document provides design criteria and practical considerations for the design of fish protection screens including applications for hydroelectric facilities, irrigation, municipal, and industrial water withdrawal projects. The major objective of the fish screen guidelines is to highlight important design elements that should be considered in the design of fish screens at water diversion projects to provide the safe downstream passage of migrating juvenile salmonids.</p>	<ul style="list-style-type: none"> • Common freshwater construction provisions • Water diversions and intakes 	<p>External peer review</p>

Table 2-3 White Papers Developed in Support of Aquatic Habitat Guidelines

Document Citation	Summary	Related HPA activities	Category
White Paper - Protection of Marine Riparian Functions in Puget Sound, Washington , 2009, prepared by Washington Sea Grant (available at wdfw.wa.gov/publications/00693/)	This document summarizes the literature review and scientific and technical information on riparian areas and makes recommendations to help protect marine riparian functions from common human activities.	<ul style="list-style-type: none"> • Saltwater habitats of special concern • Common saltwater construction provisions 	External peer review
White Paper - Marine and Estuarine Shoreline Modification Issues , 2001, prepared by Gregory Williams and Ronald Thom, Battelle Marine Sciences Laboratory (available at wdfw.wa.gov/publications/00054/)	This white paper provides an assessment of the literature associated with design and ecological considerations associated for hard and soft structural shoreline stabilization (bulkheads, rock revetments, groins, jetties, beach nourishment, biotechnology), non-structural stabilization (setbacks, vegetation management, and ground/surface water management), estuary and shoreline restoration, tidegates, outfalls, and artificial reefs.	<ul style="list-style-type: none"> • Saltwater habitats of special concern • Common saltwater construction provisions • Bank protection in saltwater areas • Artificial aquatic habitat structures • Outfall and tide and flood gate structures in saltwater areas 	External peer review
White Paper - Over-water Structures: Marine Issues , 2001, prepared by Barbara Nightingale and Charles Simenstad, University of Washington, School of Aquatic and Fishery Sciences, Seattle, Washington (available at wdfw.wa.gov/publications/00051/)	This white paper examines and summarizes the literature associated with the following structures: docks, piers, floats, rafts, log rafts, boat ramps, hoists, launches, boat houses, houseboats and associated moorings, marinas, driving and removing pilings, trash booms and trash racks, work barges, and dolphins.	<ul style="list-style-type: none"> • Common saltwater construction provisions • Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in saltwater areas • Marinas and terminals in saltwater areas 	External peer review
White Paper - Over-water Structures: Freshwater Issues , 2001, prepared by José Carrasquero (Herrera Environmental Consultants) (available at wdfw.wa.gov/publications/00052/)	This white paper examines and summarizes the literature associated with the following structures: docks, piers, floats, rafts, log rafts, boat ramps, hoists, launches, boat houses, houseboats and associated moorings, marinas, driving and removing pilings, trash booms and trash racks, work barges, and dolphins.	<ul style="list-style-type: none"> • Common freshwater construction provisions • Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in freshwater areas • Marinas and terminals in freshwater areas 	External peer review
White Paper - Treated Wood Issues in Marine and Freshwater Environments , 2001, prepared by Ted Posten, Battelle Marine Sciences Laboratory (available at wdfw.wa.gov/publications/00053/)	This white paper examines and summarizes research on chemical contaminants in treated wood and the potential for adverse impact to fish life. The assessment focused on field-oriented studies that evaluate the spatial and temporal distribution of toxic constituents used in treated wood.	<ul style="list-style-type: none"> • Common freshwater construction provisions • Streambank protection and lake shoreline stabilization • Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in freshwater areas • Marinas and terminals in freshwater areas • Common saltwater construction provisions • Bank protection in saltwater areas • Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in saltwater areas • Marinas and terminals in saltwater areas 	External peer review

Document Citation	Summary	Related HPA activities	Category
<p>White Paper - Channel Design, 2001, prepared by Dale Miller (Inter-Fluve, Inc.) (Available at wdfw.wa.gov/publications/00057/)</p>	<p>This white paper examines and summarizes the state of current knowledge and technology pertaining to channel design methods and practices including design and ecological considerations for new channels, habitat restoration and mitigation, channel relocation and realignment, channel modification for habitat and stability, placement of large woody debris (including removal and relocation), placement of boulders (including smaller rocks and substrate), off-channel ponds (rearing and other), off-channel channels (new floodplains, high-flow bypass), gradient control structures, habitat enhancement activities and structures.</p>	<ul style="list-style-type: none"> • Common construction provisions in freshwater areas • Channel relocation and realignment • Large woody material placement, repositioning, and removal in freshwater areas 	<p>External peer review</p>
<p>White Paper - Ecological Issues in Floodplain and Riparian Corridors, 2001 prepared by Susan Bolton and Jeff Shellberg, University of Washington (available at wdfw.wa.gov/publications/00058/)</p>	<p>This white paper examines and summarizes the literature pertaining to the current state of knowledge on the physical and biological effects of alluvial river channelization, channel confinement, and various channel and floodplain modifications.</p>	<ul style="list-style-type: none"> • Streambank protection and lake shoreline stabilization • Channel relocation and realignment • Large woody material placement, repositioning, and removal in freshwater areas 	<p>External peer review</p>
<p>White Paper - Dredging Activities: Marine Issues, 2001 prepared by Barbara Nightingale and Charles Simenstad, University of Washington (available at wdfw.wa.gov/publications/00055/)</p>	<p>This white paper examines and summarizes the literature pertaining to the current state of knowledge on the hydrologic, ecological, and biological effects (physical and chemical) of construction and maintenance dredging in saltwater areas associated with navigation channels, marinas, sediment clean-up, as well as other commercial developments.</p>	<ul style="list-style-type: none"> • Dredging in saltwater areas 	<p>External peer review</p>
<p>Dredging and Gravel Removal in Marine and Freshwater Environments, 2002 prepared by G. Mathias Kondolf, Matt Smeltzer, and Lisa Kimball (Center for Environmental Design Research)(available at wdfw.wa.gov/publications/00056/)</p>	<p>This white paper examines and summarizes the literature pertaining to the current state of knowledge on the hydrologic and ecological effects of in-channel bar scalping, risks and avulsions associated with floodplain pits, freshwater dredging, instream sediment sumps and gravel pits, gravel removal.</p>	<ul style="list-style-type: none"> • Dredging in freshwater areas • Sand and gravel removal 	<p>External peer review</p>

Table 2-4 White papers and two peer review documents consolidated into the Compiled White Paper for Hydraulic Project Approval Habitat Conservation Plan

Document Citation	Summary	Related HPA activities	Category
Bank Protection and Stabilization White Paper (draft) , 2006, by Jones & Stokes Associates, Anchor Environmental, L.L.C., and R2 Resource Consultants (available at wdfw.wa.gov/publications/00996/)	Compiles and summarizes existing scientific information on bank protection and stabilization projects including hard approaches, soft approaches and integrated approaches.	<ul style="list-style-type: none"> • Common freshwater construction provisions • Streambank protection and lake shoreline stabilization • Common saltwater construction provisions • Bank protection in saltwater areas 	External peer review
Overwater Structures and Non-Structural Piling White Paper , 2006, prepared by Jones & Stokes Associates, Anchor Environmental, L.L.C., and R2 Resource Consultants (available at wdfw.wa.gov/publications/00995/)	Compiles and summarizes existing scientific information on docks, piers, floats, ramps, wharfs, ferry terminals and other structures that are supported above or float on the water. This includes all structural or supporting pilings. Non-structural pilings are individual, non-structural pilings, power poles, transmission lines, conduits, etc. Pilings are driven into the stream, lake, and ocean bed.	<ul style="list-style-type: none"> • Common freshwater construction provisions • Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in freshwater areas • Common saltwater construction provisions • Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in saltwater areas. 	External peer review
Water Crossings White Paper , prepared for Washington Department of Fish and Wildlife by Jones & Stokes Associates, in association with Anchor Environmental, L.L.C. and R2 Resource Consultants (2006) (available at wdfw.wa.gov/publications/00994/)	Compiles and summarizes existing scientific information on water crossings and utility lines.	<ul style="list-style-type: none"> • Common freshwater construction provisions • Water crossings • Utility crossings in freshwater areas 	External peer review
Shoreline Modifications White Paper (draft) , 2007, by Herrera Environmental Consultants, Inc. (available at wdfw.wa.gov/publications/01003/)	Compiles and summarizes existing scientific information on jetties, breakwaters, groins, and bank barbs.	<ul style="list-style-type: none"> • Common saltwater construction provisions • Marinas and terminals in saltwater areas. 	External peer review
Marinas and Shipping/Ferry Terminals White Paper (draft) , 2007, by Herrera Environmental Consultants, Inc. (available at wdfw.wa.gov/publications/00997/)	Compiles and summarizes existing scientific information on marina and terminal structures and the area of alteration.	<ul style="list-style-type: none"> • Common freshwater construction provisions • Marinas and terminals in freshwater areas • Common saltwater construction provisions • Marinas and terminals in saltwater areas 	External peer review
Fish Passage White Paper (draft) , prepared for Washington Department of Fish and Wildlife by Herrera Environmental Consultants, Inc. in consultation with K. Bates (Working draft 2008, not to be cited)	Compiles and summarizes existing scientific information on construction, maintenance, and operation of fish passage structures.	<ul style="list-style-type: none"> • Common freshwater construction provisions • Fish passage improvement structures 	External peer review
Fish Screens White Paper (draft) , prepared for Washington Department of Fish and Wildlife by Herrera Environmental Consultants, Inc. (Working draft March 2008, not to be cited)	Compiles and summarizes existing scientific information on construction and maintenance of fish screens.	<ul style="list-style-type: none"> • Common freshwater construction provisions • Water diversions and intakes 	External peer review

Document Citation	Summary	Related HPA activities	Category
<p>Channel modifications (draft), 2007, prepared by Herrera Environmental Consultants, Inc. (available at wdfw.wa.gov/publications/01002/)</p>	<p>Compiles and summarizes existing scientific information on channel modification projects including dredging, gravel mining and scalping, sediment capping and channel creation and alignment.</p>	<ul style="list-style-type: none"> • Common freshwater construction provisions • Dredging in freshwater areas • Sand and gravel removal • Channel relocation and realignment • Common saltwater construction provisions • Dredging in saltwater areas 	<p>External peer review</p>
<p>Flow Control Structures White paper (draft), prepared for Washington Department of Fish and Wildlife by Herrera Environmental Consultants, Inc. (Working draft December 2007, not to be cited)</p>	<p>Compiles and summarizes existing scientific information on flow control structures.</p>	<ul style="list-style-type: none"> • Common freshwater construction provisions • Outfalls in freshwater areas • Water diversions and intakes • Common saltwater construction provisions • Outfalls and tide and flood gate structures in saltwater areas 	<p>External peer review</p>
<p>Habitat Modifications (draft), 2007, by Herrera Environmental Consultants, Inc. (available at wdfw.wa.gov/publications/00998/)</p>	<p>Compiles and summarizes existing scientific information on beaver dam removal and modification, large woody debris placement, movement and removal, spawning substrate augmentation, in-channel and off-channel habitat creation and modification, riparian planting, restoration and enhancement, wetland creation, restoration and enhancement, beach nourishment, reef creation, restoration and enhancement, and eelgrass and other aquatic vegetation creation, restoration and enhancement.</p>	<ul style="list-style-type: none"> • Common freshwater construction provisions • Beaver dam management • Saltwater habitats of special concern • Common saltwater construction provisions • Artificial aquatic habitat structures 	<p>External peer review</p>
<p>Peer Review of White Papers Prepared in 2006 for the Hydraulic Project Approval Habitat Conservation Plan: Small-Scale Mineral Prospecting, Overwater Structures and Non-Structural Pilings, Bank Protection and Stabilization, and Water Crossings, 2007, prepared by Duane Phinney, PH2 Consulting Services LLC (available at wdfw.wa.gov/publications/01005/)</p>	<p>Five to seven experts in each topic were selected to conduct the review. Those comments for each white paper were combined and provided to each reviewer of that white paper. A meeting was convened for each white paper after reviewers had time to review the comments of other reviewers. Discussion of important topics for each white paper at these post-review meetings elicited additional comments.</p>	<ul style="list-style-type: none"> • Common freshwater construction provisions • Streambank protection and lake shoreline stabilization • Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in freshwater areas • Mineral prospecting • Common saltwater construction provisions • Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in saltwater areas • Bank protection in saltwater areas 	<p>Not applicable</p>

Document Citation	Summary	Related HPA activities	Category
<p>Peer Review of White Papers Prepared in 2007 for the Hydraulic Project Approval Habitat Conservation Plan: Channel Modifications, Fish Passage, Flow Control Structures, Habitat Modifications, Fish Screens, Marinas And Shipping/Ferry Terminals, and Shoreline Modifications, 2007, prepared by Duane Phinney, PH2 Consulting Services LLC (available at wdfw.wa.gov/publications/01004/)</p>	<p>Three to five experts reviewed individual white papers. (Two to four Washington Department of Transportation experts reviewed five of the white papers. This is considered as one review.) Those comments for each white paper were combined by white paper section and provided to each reviewer of that white paper. The Peer Review Coordinator subsequently convened a post-review meeting for each white paper.</p>	<ul style="list-style-type: none"> • Common freshwater construction provisions • Marinas and terminals in freshwater areas • Fish passage improvement structures • Water diversions and intakes • Dredging in freshwater areas • Sand and gravel removal • Channel relocation and realignment • Beaver dam management • Outfalls in freshwater areas • Common saltwater construction provisions • Saltwater habitats of special concern • Marinas and terminals in saltwater areas • Dredging in saltwater areas • Artificial aquatic habitat structures • Outfalls and tide and flood gate structures in saltwater areas 	<p>Not applicable</p>

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In 2006 and 2007, WDFW contracted with Anchor Environmental, Herrera Environmental Consultants, Jones & Stokes Associates, and R2 Resource Consultants to further develop eleven “white papers” documenting the state of the science on a range of topics related to HPAs. Each of the white papers was prepared as a stand-alone document. Therefore, many of the white papers contained information specific to a particular activity as well as more general information pertinent to more than one kind of HPA-permitted activity. In 2008, WDFW staff organized, condensed, and edited the information from ten of the eleven white papers, along with comments received during peer reviews, into the *Compiled White Paper for Hydraulic Project Approval Habitat Conservation Plan* (HCP) located on the WDFW website at wdfw.wa.gov/publications/00803/. The eleventh white paper, *Small-scale mineral prospecting* (available at wdfw.wa.gov/publications/00293/), was not included in this consolidation because the Washington Administrative Code (WAC) sections covering mineral prospecting were updated independently and adopted by the Washington Fish and Wildlife Commission in 2008.

A list of White Papers and peer-review comments that were consolidated into the *Compiled White Paper for Hydraulic Project Approval Habitat Conservation Plan* are in Table 2-4. WDFW used the scientific and design information in the white papers and information from a review of applicable science published since 2008 to help develop the specific standards for hydraulic projects in the proposed Hydraulic Code Rules represented in Alternative 2.

Tables 2-2, 2-3, and 2-4 provide lists of the guideline and white paper documents completed since 1999. Pursuant to RCW 34.05.271, which includes specific requirements for how WDFW should identify and make available the sources of information used in taking a significant agency action, the category for each reference is identified.

2.1.1.5 Rule Section Reorganization

The proposed rule changes represent not only changes in substance of the provisions, but also represent a reorganization of the material to help readers better find the information they need. Rules are reorganized by topic and project type. Table 2-5 shows how the material is laid out, crosswalks the old and new (proposed) WAC sections, and describes the content of each (proposed) section.

Table 2-5 Rule Section Reorganization

New WAC Section Name	New WAC Section Number	Existing WAC Number
Purpose Purpose statement gives an overview of the intent of the rules.	220-660-010	220-110-010
Instructions for using chapter Describes how an applicant would follow the common technical provisions for hydraulic projects and how the department uses the provisions to condition HPAs and also refers applicants to WDFW guidance documents for help.	220-660-020	New section
Definitions Defines the terms used in the chapter.	220-660-030	220-110-020

New WAC Section Name	New WAC Section Number	Existing WAC Number
<p>Applicability of hydraulic project approval authority</p> <p>Describes when an HPA is required and the activities that do not require a person to get an HPA.</p>	220-660-040	220-110-035
<p>Procedures</p> <p>Describes the procedures applicants follow to apply for an HPA. It also describes the procedures the department follows to review applications and make permit decisions. Guidance for applying for an HPA is provided on the department’s website (wdfw.wa.gov).</p>	220-660-050	220-110-030,031
<p>Integration of hydraulic projects approvals and forest practices applications</p> <p>Describes the Integration of hydraulic project approvals and forest practices applications</p>	220-660-060	220-110-085
<p>Changes to hydraulic project approval technical provisions</p> <p>Describes the established conditions that allow the department to add, modify, or delete technical provisions in these proposed rules.</p>	220-660-070	220-110-032
<p>Mitigation requirements for hydraulic projects</p> <p>Defines how the department will apply mitigation sequencing to protect fish life.</p>	220-660-080	New Section
<p>Technical provisions</p> <p>Combines the introductions to the freshwater and saltwater technical provision sections into a single introduction section; no substantive changes to the existing language.</p>	220-660-090	220-110-040,230
<p>Freshwater habitats of special concern</p> <p>Freshwater habitats of special concern provide essential functions to the developmental life histories of twenty-two priority fish species. Priority fish species include species that are listed under state and federal endangered species laws, and species of recreational, commercial, or tribal importance.</p>	220-660-100	New section
<p>Authorized work times in freshwater areas</p> <p>The department authorizes work during less critical times of the year to reduce the risk of impacts to fish life at certain life stages. In-water work is not allowed during critical periods of the year unless a person can implement mitigation measures to eliminate risk to fish life.</p>	220-660-110	New section
<p>Common freshwater construction provisions</p> <p>Common freshwater construction provisions can apply to many hydraulic projects. However, only applicable common construction provisions will be applied to a specific hydraulic project. Common construction provisions include job site access, equipment use, construction materials, sediment and erosion control containment, in-water work area isolation, fish removal, job site repair, and revegetation.</p>	220-660-120	New section
<p>Streambank protection and lake shoreline stabilization</p> <p>Streambank protection and lake shoreline stabilization structures are permanent or temporary structures constructed to reduce or prevent streambank and shoreline erosion. Structural techniques armor the bank with material such as riprap, concrete, or timber. Biotechnical techniques attempt to mimic natural processes by using live plantings, rootwads, and large woody material (LWM). Biotechnical techniques usually impact fish life less than structural techniques. Some projects integrate both structural and biotechnical techniques.</p>	220-660-130	220-110-050,223

New WAC Section Name	New WAC Section Number	Existing WAC Number
<p>Residential and public recreational docks, piers, ramps, floats watercraft lifts, and buoys in freshwater areas</p> <p>Docks are structures that are fixed to the shoreline but floating upon the water. Piers are fixed, pile-supported structures. Floats (rafts) are floating structures that are moored, anchored, or otherwise secured in the water that are not directly connected to the shoreline. A ramp is a gangway that connects a pier or shoreline to a float and provides access between the two. Pilings usually associated with these structures are timber, steel, reinforced concrete, or composite posts that are driven, jacked, or cast vertically into the bed. A watercraft lift is a structure that lifts boats and personal watercraft out of the water. A mooring buoy is a structure floating on the surface of the water that is used for private and commercial vessel moorage.</p>	220-660-140	220-110-060
<p>Boat ramps and launches in freshwater areas</p> <p>A boat ramp or launch is a sloping, stabilized roadway or entry point constructed on the shoreline for launching boats from vehicular trailers or by hand for primitive boat launch designs. Ramps and launches extend into the water at a slope of typically twelve to fifteen percent and are typically oriented perpendicular to the shoreline. Ramp and launch widths vary with intended use, whereas the length often depends on the slope of the shoreline and seasonal water levels. Ramps and launches are usually constructed in areas protected from wind and waves with access to deep water close to shore. Construction materials commonly consist of gravel, concrete, or asphalt; they are often associated with marinas and parking lots.</p>	220-660-150	220-110-224
<p>Marinas and terminals in freshwater areas</p> <p>A marina is a public or private facility providing vessel moorage space, fuel, or commercial services. Commercial services include overnight or live-aboard vessel accommodations (RCW 77.55.011(13)). A terminal is a public or private commercial wharf located in the navigable waters of the state and used, or intended to be used, as a port or facility for the storing, handling, transferring, or transporting of goods, or transporting passengers and vehicles, to and from vessels (RCW 77.55.011(14)).</p>	220-660-160	New section
<p>Dredging in freshwater areas</p> <p>Dredging includes removing substrate or sediment from rivers and lakes to improve vessel navigation and to maintain navigational channels and sediment traps for flow conveyance. River dredging is also used for flood abatement and to clean up contaminated sediments.</p>	220-660-170	220-110-130
<p>Sand and gravel removal</p> <p>Sand and gravel deposited by river processes is used as construction aggregate for roads and highways (base material and asphalt), pipelines (bedding), septic systems (drain rock in leach fields), and concrete (aggregate mix) for highways and buildings. In some areas, people remove aggregate mainly from river deposits, either from pits in river floodplains and terraces, or by removing gravel directly from riverbeds with heavy equipment.</p>	220-660-180	220-110-140
<p>Water crossing structures</p> <p>Water crossings are structures constructed to facilitate the movement of people, animals, or materials across or over rivers and other bodies of water. These structures include bridges, culverts, fords, and conduits; this chapter covers bridges, culverts, and fords and WAC 220-660-270 covers conduits. Generally, people use bridges to cross over larger streams and rivers, or over unstable channels; they use culverts to cross over smaller streams and they use fords when other stream crossing options would result in a greater impact to fish and their habitats.</p>	220-660-190	220-110-070

New WAC Section Name	New WAC Section Number	Existing WAC Number
<p>Fish passage improvement structures</p> <p>Fish passage improvement structures facilitate the passage of fish through or around a barrier. They restore upstream and downstream fish access to habitats that have become isolated by human activities such as placing culverts, dams, and other artificial obstructions.</p>	220-660-200	New section
<p>Channel change and realignment</p> <p>Channel relocation may solve problems of channel encroachment and/or confinement, and foster the development of a new channel with appropriate channel morphology and healthy riparian zones. Channel relocation permanently changes the location of the channel. The new channel should be designed with bioengineered stability, rather than structural stability, so that the profile, pattern, cross-section, and bed elevation can be expected to achieve long-term natural functioning.</p>	220-660-210	220-110-080
<p>Large woody material placement, repositioning and removal in freshwater areas</p> <p>Large woody material (LWM) is trees and tree parts that enter stream channels mainly from streambank undercutting, wind throw, and slope failures. Public agencies sometimes reposition or remove large woody material to address a threat to life, the public, or property. Large woody material is also placed in streams to restore or create fish habitat.</p>	220-660-220	220-110-150
<p>Beaver dam management</p> <p>A person may need to remove, breach, or modify a beaver dam to prevent flood damage to private and public land or infrastructure. Beaver dams are normally removed using hand tools or equipment such as backhoes. An alternative to frequent dam removal is installing a beaver exclusion device. These devices prevent beavers from building a dam at the mouth or inside of culverts that blocks water flow. Installing a water level (flow) control device may be a preferred alternative to removing an established dam that has created or maintains a wetland. A person can install a water level control device to maintain a desirable beaver wetland. These devices are installed at the intended depth, extending upstream and downstream of the dam. This preserves the pond's habitat benefits.</p>	220-660-230	New section
<p>Pond construction</p> <p>Out-of-channel ponds may be constructed for livestock watering, irrigation, fire protection, or another purpose.</p>	220-660-240	220-110-180
<p>Water diversions and intakes</p> <p>Surface water diversions are common instream features in agricultural areas where the water is used for irrigation. Throughout the state, people also divert water for other agricultural, hydropower, industrial, recreational, residential, municipal, and hatchery uses.</p>	220-660-250	220-110-190
<p>Outfall structures in freshwaters areas</p> <p>Outfalls move water from one place to another, typically to a body of water. Outfalls may convey irrigation water, stormwater, or other waste materials.</p>	220-660-260	220-110-170
<p>Utility crossings in freshwater areas</p> <p>Utility lines are cables and pipelines that transport gas, telecommunications, fiber optics, power, sewer, oil, and water lines from one side of a watercourse to the other.</p>	220-660-270	220-110-100

New WAC Section Name	New WAC Section Number	Existing WAC Number
<p>Felling and yarding of timber</p> <p>Timber felling includes “bucking” or cutting the felled tree into short lengths and limbing the felled tree. Yarding is the process of hauling logs from the cutting area to the landing and includes skidding (dragging the logs across the ground). There are three main kinds of yarding systems: ground based, cable, and aerial logging.</p>	220-660-280	220-110-160
<p>Aquatic plant removal and control</p> <p>Aquatic plant removal and control means the physical and mechanical methods to remove or control aquatic plants. It does not address aquatic plant control using grass carp, herbicides, or water column dye.</p>	220-660-290	220-110-331 through 338
<p>Mineral prospecting</p> <p>Mineral prospecting projects excavate, process, or classify aggregate using hand-held mineral prospecting tools and mineral prospecting equipment. When prospectors locate valuable minerals through prospecting, they may attempt to recover larger quantities of the minerals using a variety of machines, including suction dredges, high bankers, and heavy equipment. The rules in this section apply to the use of hand-held mineral prospecting tools and small motorized equipment.</p>	220-660-300	220-110-200 through 206
<p>Tidal reference areas</p> <p>The department uses the following tidal reference areas to delineate segments of the state's marine shorelines. The authorized work times in saltwater areas vary by tidal reference area.</p>	220-660-310	220-110-240
<p>Saltwater habitats of special concern</p> <p>Saltwater habitats of special concern provide essential functions in the developmental life history of fish life.</p>	220-660-320	220-110-250
<p>Authorized work times in saltwater areas</p> <p>The department applies timing windows to reduce the risk of impacts to fish life at critical life stages. In-water work is not allowed during critical periods of the year unless a person can take mitigation measures to eliminate risk during critical periods.</p>	220-660-330	220-110-271
<p>Intertidal forage fish spawning bed surveys</p> <p>The department uses intertidal forage fish spawning habitat surveys to determine presence, absence, quantity, and timing of surf smelt (<i>Hypomesus pretiosus</i>) and Pacific sand lance (<i>Ammodytes hexapterus</i>) spawning. The presence of spawning may restrict project type, design, location, and timing.</p>	220-660-340	New section
<p>Seagrass and macroalgae habitat surveys</p> <p>The department has developed survey guidelines for seagrass and macroalgae habitat to improve protection of these important habitats in Puget Sound and coastal waters. The guidelines contain protocols for both preliminary and advanced surveys to help evaluate potential impacts to these habitats at project sites with various conditions.</p>	220-660-350	New section
<p>Common construction provisions for saltwater areas</p> <p>Common saltwater construction provisions can apply to many hydraulic projects. However, only applicable common construction provisions will be applied to a specific hydraulic project. Common construction provisions include job site access, equipment use, construction materials, sediment and erosion control</p>	220-110-360	220-660-270

New WAC Section Name	New WAC Section Number	Existing WAC Number
containment, and job site repair and revegetation		
<p>Bank protection in saltwater areas</p> <p>A bank protection structure is a permanent or temporary structure constructed to protect or stabilize the bank. Bank protection methods are either hard or soft techniques. Soft approaches attempt to mimic natural processes by using biotechnical methods such as live plantings, rootwads and large woody material (LWM), and beach nourishment. Hard approaches armor the bank with material such as rock, concrete, or wood intended to prevent erosion of the bank. Some projects use both hard and soft approaches, but to be considered soft, the total area of the project must consist of at least 85% in aerial extent naturally-occurring materials used in ways that are consistent with the shore processes taking place in the vicinity of the project. The remaining 15% of the total project area must not interrupt sediment delivery to the beach (e.g., must not bulkhead a feeder bluff) and still be called soft. The total area extends cross-shore from MLLW to OHWL, and long-shore from a line perpendicular to the shoreline at the beginning of one end of construction to the other end.</p>	220-660-370	220-110-280
<p>Residential and public recreational docks, piers, ramps, floats watercraft lifts, and buoys in saltwater areas</p> <p>Docks are structures that are fixed to the shoreline but floating upon the water. Piers are fixed, pile-supported structures. Floats (rafts) are floating structures that are moored, anchored, or otherwise secured in the water that are not directly connected to the shoreline. A ramp is a gangway that connects a pier or shoreline to a float and provides access between the two. Pilings usually associated with these structures are timber, steel, reinforced concrete, or composite posts that are driven or jacked into the bed. A watercraft lift is a structure that lifts boats and personal watercraft out of the water. A mooring buoy is a structure floating on the surface of the water that is used for private and commercial vessel moorage.</p>	220-660-380	220-110-300
<p>Boat ramps and launches in saltwater areas</p> <p>A boat ramp or launch is a sloping stabilized roadway or entry point constructed on the shoreline for launching boats from vehicular trailers or by hand for primitive boat launch designs. Ramps and launches extend into the water at a slope of typically twelve to fifteen percent and are typically oriented perpendicular to the shoreline. Ramp and launch widths vary with intended use, and the length often depends on the slope of the shoreline and tidal amplitudes. Ramps and launches are usually constructed in protected areas with access to deep water close to shore. Construction materials commonly consist of gravel, concrete, or asphalt; they are often associated with marinas and parking lots. A railway-type boat launch consists of a pair of railroad tracks supported by pilings, and extends from the upland down to the beach.</p>	220-660-390	New section
<p>Marinas and terminals in saltwater areas</p> <p>A marina is a public or private facility providing vessel moorage space, fuel, or commercial services. Commercial services include overnight or live-aboard vessel accommodations (RCW 77.55.011(13)). A marine terminal is a public or private commercial wharf located in the navigable waters of the state and used, or intended to be used, as a port or facility for the storing, handling, transferring, or transporting of goods, passengers, and vehicles to and from vessels (RCW 77.55.011(14)).</p>	220-660-400	220-110-330
<p>Dredging in saltwater areas</p> <p>Dredging includes removing substrate to improve vessel navigation and to maintain channels. Dredging is also used to clean up contaminated sediments.</p>	220-660-410	220-110-320

New WAC Section Name	New WAC Section Number	Existing WAC Number
Artificial aquatic habitat structures in saltwater areas An artificial aquatic habitat structure is a structure that humans design and place to provide long-term alterations to saltwater bottom habitat. The structure is designed and located to contribute to fish and shellfish management. One example is an artificial reef.	220-660-420	New section
Outfalls and tide and flood gates in saltwater areas Outfalls move water from one place to another, typically to a body of water. Outfalls may convey stormwater, or other waste materials. Tide and flood gates are adjustable gates used to control water flow in estuary, river, stream, or levee systems.	220-660-430	New section
Utility crossing in saltwater areas Utility crossings are cables and pipelines that transport gas, telecommunications, fiber optics, power, sewer, oil, or water underneath waterbodies.	220-660-440	220-110-310
Test boring in saltwater areas Boring is used to obtain information about the physical properties of the bed. This information is often needed to design foundations for proposed structures and to repair existing structures. Test boring is also commonly used to gather information about the contamination levels of sediment proposed for dredging.	220-660-450	New section
Informal appeal of adverse administrative actions Describes the processes to informally appeal an HPA permit decision to the department's HPA Appeals Coordinator.	220-660-460	220-110-340
Formal appeal of administrative actions Describes the process to formally appeal an HPA permit decision to the Pollution Control Hearings Board.	220-660-470	220-110-350
Compliance Describes the civil compliance and criminal penalty processes.	220-110-480	220-110-360

2.2 Alternatives

Table 2-6 summarizes provisions for the hydraulic project rule change alternatives. The table indicates the WAC title and section of the proposed rule, the WAC section of the existing rule, and a summary of provisions for each of the alternatives.

Alternative 1 (No-Action Alternative) is not represented on these tables because no changes are proposed.

2.2.1 No Action Alternative 1 – Current Rule

Under the No Action Alternative, WDFW would not update the Hydraulic Code Rules and would continue to implement the existing rules (Chapter 220-110 WAC). The current rules can be accessed at: apps.leg.wa.gov/wac/default.aspx?cite=220-110. Under Alternative 1, the current rules would not be updated to better align with statutes or incorporate available fish science and technology, and the procedural and administrative requirements would not be improved.

2.2.2 Alternative 2 – WDFW-Proposed Rule Changes (Preferred Alternative)

The Preferred Alternative includes changes to existing sections of the Hydraulic Code Rules, new sections, new definitions, and new procedures for implementation. The updated rules are easier to read because they are organized by project type or topic. The updated rules also include explanations for the provisions for hydraulic projects by describing the fish life concerns for each type of project.

The provisions included in Alternative 2 represent the culmination of work to align with statutory changes, integrate current fish science and design technology, and improve procedural and administrative requirements. Changes were made to the Preferred Alternative based on comments received during the last review round.

Proposed rule changes for the Preferred Alternative are presented concurrently with this document, and comments will be taken separately on this EIS and the most recent proposed rules.

2.2.3 Alternative 3 – Increased Protection for Fish Life

A number of commenters on the September 2013 PEIS recommended that WDFW consider alternatives that are more restrictive than the WDFW-proposed rule changes. Some commenters recommended eliminating streamlined HPA permitting processes. Others recommended the rules require compensatory mitigation for cumulative impacts or to maintain structures that do not meet current standards because the maintenance work perpetuates impacts into the future. The overall approach is more precautionary and prescriptive than the approach proposed in Alternative 2.

This alternative responds to comments to provide higher levels of protection/restriction to protect fish life. Specific aspects of this alternative are based on Tribal, Environmental Coalition and other stakeholder and public comments. A few of the Alternative 3 proposals are not able to be implemented by the Fish and Wildlife Commission because the topic is regulated by statute (legislated law) not rule; these are identified in Table 2-6.

2.2.4 Alternative 4 – Increased Protection for the Built Environment

A number of commenters on the September 2013 PEIS recommended that WDFW consider alternatives that are less restrictive than the proposed rule changes. Some commenters recommended the Commissioners limit the authority that allows WDFW to issue HPAs for hydraulic projects to only those projects waterward of the ordinary high water line. Others recommended the rules provide protection only for fish and shellfish present at the work site but not their habitat. Other recommendations were made for less restrictive alternatives.

This alternative responds to comments to provide less protection/restrictions to reduce project costs. Specific recommendations in this alternative are based on comments from Federal Highway Administration, Washington State Department of Transportation, city and county public works agencies, and other stakeholders. A few of the Alternative 4 proposals are not able to be implemented by the Fish and Wildlife Commission because the topic is regulated by statute (legislated law) not rule; these are identified in Table 2-6.

Table 2-6 Summary of Alternatives to Hydraulic Project Regulations (Chapter 220-660 WAC)

Note: No changes are proposed for Alternative 1; provisions of alternative 1 are not depicted on Table 2-6.

WAC Title (E) Existing (P) Proposed	Alternative 2 WDFW Proposed Rule Changes	Alternative 3 Increased Protection for the Natural Environment	Alternative 4 Increased Protection for the Built Environment
Technical provisions E 220-110-040 E 220-110-230 P 220-660-090	Combines the introductions to the freshwater and saltwater technical provision sections into a single introduction section; no substantive changes to the existing language.	Same as Alt. 2 (Minor or no comments)	Same as Alt. 2 (Minor or no comments)
Purpose E 220-110-010 P 220-660-010	Purpose statement intent remains the same, but narrative is restated in a more concise manner.	Same as Alt. 2 (Minor or no comments)	Amends the language to limit HPA authority to projects waterward of the ordinary high water line.
Instructions for using chapter E New section P 220-660-020	Describes how an applicant would follow the common technical provisions for hydraulic projects and how the department uses the provisions to condition HPAs; also refers applicants to WDFW guidance documents for help.	Same as Alt. 2 (Minor or no comments)	Same as Alt. 2 (Minor or no comments)
Definitions E 220-110-020 P 220-660-030	<ul style="list-style-type: none"> Forty-six new definitions are added including the following: The proposed definition of “Fish habitat” means habitat, which is used by fish life at any life stage at any time of the year including potential habitat likely to be used by fish life, that could reasonably be recovered by restoration or management and includes off-channel habitat. The definitions of freshwater area, saltwater area, and watercourse are amended to include surface water connected wetlands that provide or maintain fish habitat. Definitions for maintenance, repair, rehabilitation and replacement are added. These terms are used in the mitigation section to clarify when compensatory mitigation is required or when work must comply with current standards. Unimpeded fish passage is defined. “Unimpeded fish passage” means the free movement of all fish species at any mobile life stage around or through a human-made or natural structure. 	Same as Alt. 2 (Minor or no comments)	<ul style="list-style-type: none"> Retains the Alternative 2 definitions except for the following changes: Amend the definition of fish habitat to the following: “Fish habitat” means habitat, which is used by fish life at any life stage at any time of the year. Remove “wetlands” from the definitions of “freshwater area”, “saltwater area” and “watercourse”. Delete the definitions of maintenance, repair, rehabilitation and replacement and proposes all these activities should be considered maintenance. Delete unimpeded from the “unimpeded fish passage”.
Applicability of hydraulic project approval authority E 220-110-035 P 220-660-040	Outdated language transferring hydraulic code authority to DNR for forest practices hydraulic projects in non-fish waters is removed because of the integration of all hydraulic code authority in DNR forest practices. Portable boat hoists and scientific instruments are added to the list of exempt project types.	Same as Alt. 2 (Minor or no comments)	Same as Alt. 2 (Minor or no comments)

* Requires Statutory change

WAC Title (E) Existing (P) Proposed	Alternative 2 WDFW Proposed Rule Changes	Alternative 3 Increased Protection for the Natural Environment	Alternative 4 Increased Protection for the Built Environment
<p>Procedures E 220-110-030 E 220-110-031 P 220-660-050</p>	<ul style="list-style-type: none"> Modifies current rules to reflect statutory and policy changes including: Maintains ability to issue “general” or “simplified” HPAs for repair and maintenance projects because these are typically routine in nature and can be pre-conditioned, reserving limited resources for projects that pose higher risk to fish life. Establishes procedures for applying for two new HPA types established by statute: fish habitat enhancement project (FHEP) and chronic danger HPAs. Clarifies the procedures for applying for existing HPA types including standard, emergency, imminent danger, expedited, and pamphlet HPAs. Two new standard HPA types, “general HPAs” and “model HPAs” are proposed to streamline the permitting process for low risk hydraulic projects. Limits multi-site HPAs to five sites, unless the department makes an exception, to ensure site visits can be conducted with the 45-day review period. Delays issuing HPAs for a minimum of 7 days to allow the Tribes and other entities an opportunity to comment on complete HPA applications. Allows subsequent minor modifications to an existing HPA permit provided the modifications do not adversely affect fish life. Clarifies how the department processes HPA applications. 	<ul style="list-style-type: none"> Retains the Alternative 2 language except for the following changes: Remove the ability to issue “general” or “model” HPAs due to concerns that the opportunity for a meaningful and useful individual project review is removed to achieve streamlining. Delay issuing HPAs for a minimum of 20 days to allow the Tribes and other entities an opportunity to comment on the complete HPA application. Provide Tribes an opportunity to comment on emergency, imminent danger, expedited, and HPAs with minor modifications before they are issued. * Allow one minor modification to an existing HPA permit, provided modifications do not adversely affect fish life. Create a pamphlet for the removal of impacted fine grained sediments and sand from spawning gravel stream beds deposited there as a result of surface water runoff discharge into streams.* Eliminate the \$150 application fee for restoration projects.* Authorize additional types of fish habitat enhancement projects.* 	<ul style="list-style-type: none"> Retains the Alternative 2 language except for the following changes: Remove the limit on the number of sites covered in a multi-site HPA. Add more flexibility on how an emergency, imminent danger or chronic danger is declared, and additional positions authorized to make these declarations to improve the efficiency and ease for government agencies to receive HPAs.*
<p>Integration of hydraulic projects approvals and forest practices applications E 220-110-085 P 220-660-060</p>	<p>Retains the existing section that was added in 2013 to implement SB 6406. The amendment required the integration of hydraulic code rule fish protection standards (Title 220 WAC) into the forest practices rules for hydraulic projects in fish-bearing waters on forest land. The rules stipulate how the department will work with DNR and the applicant.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>The Alternative 2 language would be replaced by a new section that repeats the all of the rules applicable to forest practices.</p>
<p>Changes to hydraulic project approval technical provisions E 220-110-032 P 220-660-070</p>	<p>Retains the 1994 rule language that allows the department to add, modify and delete technical provisions when certain criteria are demonstrated. Language is also added to allow the department to modify and delete technical provision that are not possible to comply with due to geological, engineering or environmental constraints or safety concerns;</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<ul style="list-style-type: none"> Retains the Alternative 2 language except for the following change: Remove this clause "loss of or injury to fish or shellfish, or the loss or permanent degradation of the habitat that supports the fish and shellfish populations" and replace it with "will be protective of fish life."
<p>Mitigation requirements for hydraulic projects E New Section P 220-660-080</p>	<ul style="list-style-type: none"> Incorporates statutes and policies adopted since 1994 and includes the following: Establishes the baseline for measuring impacts as the existing habitat condition. Does not require compensatory mitigation for maintenance projects (routine, repair, rehabilitation, and replacement) unless the maintenance work caused a new impact not associated with the original work. Requires design and construction of rehabilitation and replacement projects to comply with the proposed rules. 	<ul style="list-style-type: none"> Retains the Alternative 2 language except for the following changes: Require compensatory mitigation for cumulative impacts.* Require compensatory mitigation for maintaining or repairing a structure that currently diminishes habitat and/or perpetuates impacts into the future. Require the same mitigation for rehabilitation or replacement of structurally deficient or functionally obsolete structures that is required for new structures (including mitigation). 	<ul style="list-style-type: none"> Retains Alternative 2 language except for the following changes: Do not require compensatory mitigation for routine maintenance, repair, rehabilitation, or replacement of the structure even if new impacts to fish life occurred as a result of the work. Delete the provision "mitigation must compensate for temporal loss, uncertainty of performance, and differences in habitat functions, type, and value" because these values are difficult to quantify.

* Requires Statutory change

WAC Title (E) Existing (P) Proposed	Alternative 2 WDFW Proposed Rule Changes	Alternative 3 Increased Protection for the Natural Environment	Alternative 4 Increased Protection for the Built Environment
<p>Freshwater habitats of special concern E New section P 220-660-100</p>	<p>Identifies freshwater habitats of special concern for priority fish species. This habitat requires protective measures for priority fish species due to their population status or sensitivity to habitat alteration.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Authorized work times in freshwater areas E New section P 220-660-110</p>	<p>Specifies the criteria the department will follow to determine when work should occur. The criteria include life history stages of fish life present, the expected impact of the work, BMPs proposed by the project proponent, weather, and other conditions. Requires the department to publish the times when spawning salmonids and their eggs and fry are least likely to be in freshwaters of Washington.</p>	<ul style="list-style-type: none"> Retains Alternative 2 provisions except the following: All in-water work would be prohibited during times of the year when spawning salmonids and their incubating eggs are likely to be present regardless of the expected impact from the work, best management practices, weather, and other conditions. 	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Common freshwater construction provisions E New section P 220-660-120</p>	<p>Combines the common construction provisions that apply to many freshwater projects into a single section. New provisions are added for staging areas, job site access, equipment use, materials, water quality protection, aquatic work area isolation, diversion pumps, fish removal and demobilization, and cleanup.</p>	<ul style="list-style-type: none"> Retains Alternative 2 provisions except for the following change: The use of all treated wood and tires would be prohibited. 	<p>Retains Alternative 2 provisions except for the following provisions would be removed: Remove sections eight through twelve. (8) In-water work area isolation using block nets (9) In-water work area isolation using a temporary bypass (10) In-water work area isolation using a cofferdam structure (11) In-water work without a bypass or cofferdam (12) Fish removal</p>
<p>Streambank protection and lake shoreline stabilization E 220-110-050 E 220-110-223 P 220-660-130</p>	<p>New restrictions are added to the existing rules including the following: Separate provisions for design and construction to clarify when standards apply. Allows the department to require an applicant to submit a qualified professional's rationale with the HPA application for a new or replacement structure extending waterward of the existing structure or bankline. Requires the permittee to avoid or minimize adverse impacts to fish life by using the least impacting technically feasible alternative. Benchmarks must be established so the department can verify compliance with the approved plans. In cases where the bankline of a river or stream has changed as a result of meander migration or lateral erosion and a new ordinary high water line has formed landward of an existing lake bulkhead, the rule requires the current location of the new bank be maintained with some exceptions.</p>	<ul style="list-style-type: none"> Retains Alternative 2 provisions except for the following changes: The department would always require an engineer's report that unequivocally determines bank protection or shoreline stabilization is needed to protect infrastructure before allowing any form of bulkhead or armoring work. If protection is warranted, the department would firmly require a biotechnical solution unless an engineer clearly finds that a hard bulkhead is the only option. The placement of new and replacement structures would have to consider climate change. 	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Residential and public recreational docks, piers, ramps, floats watercraft lifts, and buoys in freshwater areas E 220-110-060 P 220-660-140</p>	<ul style="list-style-type: none"> Adds new provisions for overwater structures in waterbodies where impacts to fish spawning areas and to juvenile salmonid migration corridors and feeding and rearing areas are a concern. Provisions are also added to the existing rules for the following: <ul style="list-style-type: none"> Pile design Steel impact driving sound attenuation Watercraft lift design Mooring buoy design Residential and public recreational dock, pier, ramp, float, watercraft lift, and buoy construction. 	<ul style="list-style-type: none"> Retains Alternative 2 provisions except for the following change: All docks, piers, ramps and floats would have 100% of the deck covered in grating. 	<ul style="list-style-type: none"> Retains Alternative 2 except for the following changes: Remove all grating requirements because some research shows the sunlight penetrated through the grating on average about 10% more than traditional planked decking. Do not specify pier height or width requirements for waterbodies where impacts to juvenile salmonid migration corridors and feeding and rearing areas are a concern.

* Requires Statutory change

WAC Title (E) Existing (P) Proposed	Alternative 2 WDFW Proposed Rule Changes	Alternative 3 Increased Protection for the Natural Environment	Alternative 4 Increased Protection for the Built Environment
<p>Boat ramps and launches in freshwater areas E 220-110-224 P 220-660-150</p>	<p>New provisions are added to the existing rules for boat ramp and launch design and construction to minimize impacts to the bed including fish spawning areas, the movement of wood and sediment, and juvenile fish migration, feeding, and rearing areas.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Marinas and terminals in freshwater areas E New section P 220-660-160</p>	<p>A new section is added for marina and terminal design, construction, and maintenance. The maintenance provisions align with a change to the statute.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<ul style="list-style-type: none"> Retains Alternative 2 except for the following change: Acknowledge the different purposes, requirements, and constraints of bulkheads and other bank stabilization in the marina/marine terminal environment.
<p>Dredging in freshwater areas E 220-110-130 P 220-660-170</p>	<ul style="list-style-type: none"> New provisions are added to the existing rules to allow the department to assess impacts more accurately and includes the following provisions: The department may require quantitative analysis of the extraction rate to determine impacts to sediment transport and delivery. The department may require multi-season pre- and post-dredge project bathymetric or biological surveys. The department will evaluate the potential impacts of dredging and the disposal of dredged materials in eulachon spawning areas. 	<ul style="list-style-type: none"> Retain Alternative 2 provisions except for the following changes: Include rules for removing gravel and debris from small streams in the proposed rule changes. Require scientific justification to prove that dredging will resolve flooding problems before any HPAs for dredging are issued. 	<ul style="list-style-type: none"> Retain Alternative 2 provisions except for the following changes: Include rules for removing gravel and debris from small streams in the proposed rule changes. Authorize dredging in fish spawning areas.
<p>Sand and gravel removal E 220-110-140 P 220-660-180</p>	<p>A new provision is added to the existing rules to clarify that the department may require quantitative analysis of the extraction rate to determine impacts to sediment transport and delivery. This new provision would allow the department to assess impacts more accurately.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Water crossing structures E 220-110-070 P 220-660-190.</p>	<p>Retains current rule language for no-slope culvert design. Hydraulic culvert design provisions are moved to the fish passage improvement structure section. New provisions are added for design of the stream-simulation and an alternative culvert design methods. Some of the current language for bridges is retained but new provisions are added for design and construction. New provisions are added for design and construction of temporary fords.</p>	<ul style="list-style-type: none"> Retains Alternative 2 provisions except for the following changes: Include language that requires permittees to install stream simulation culverts unless the permittee can show that stream simulation is not feasible, or that another design will provide equal or better protection of fish life. Remove the no-slope design alternative because it is inconsistent with the recent federal court order regarding state culverts because no-slope designed culverts are often found to impede fish passage. Move this design approach to the fish passage improvement section. 	<ul style="list-style-type: none"> Retains Alternative 2 provisions except for the following changes: The culvert design standards would be removed. The designs proposed are not based on technically sound engineering practices and are not justified by significant research. The bridge design standards would be amended because they may require the preparation of multiple designs so that the cost differential can be quantified, thus increasing the time and costs associated with all bridge projects. Amend the rules to allow American Association of State Highway and Transportation Officials and Federal Highway Administration standards (by name) because they have been well vetted by the engineering community. Amend the rules to use a channel forming flow, such as the 2-year flood, instead of a rare flood like the 100-year to evaluate how changes in flow velocity will affect fish life. WDFW's focus should be on fish life and the channel below the OHWL. Over the course of a bridge's lifespan, the flow velocity during the 100-year flood will have less influence on the channel form than the 2-year flood. Remove the three-feet of clearance for bridges.

* Requires Statutory change

WAC Title (E) Existing (P) Proposed	Alternative 2 WDFW Proposed Rule Changes	Alternative 3 Increased Protection for the Natural Environment	Alternative 4 Increased Protection for the Built Environment
<p>Fish passage improvement structures E New section P 220-660-200</p>	<p>A new section is added for design, construction, and maintenance of fish ladders, weirs constructed for fish passage, roughened channels, trap and haul operations, and hydraulic design culvert retrofits. Designs must have an engineer’s approval and meet specific criteria. The structures must be inspected and maintained.</p>	<ul style="list-style-type: none"> Retains Alternative 2 provisions except for the following changes: All structures would be temporary and a timeframe would be established in rule for a permanent solution to be implemented. Roughened channel would be a temporary solution used only in extreme circumstances with a valid reason why a more reliable fish passage method (e.g. stream simulation or bridge) cannot be used. Hydraulic design option culverts would have limited application in exceptional circumstances where constraints prevent the use of bridges, no-slope and stream simulation culverts. 	<ul style="list-style-type: none"> Retains Alternative 2 provisions except for the following change: The department would not require compensatory mitigation if a fish passage structure cannot pass all fish species present at all mobile life stages.
<p>Channel change and realignment E 220-110-080 P 220-660-210</p>	<ul style="list-style-type: none"> The following new provision is added to the existing rules for channel change and realignment design: A channel change may be approved if: Permanent new channels are similar to the old channel in length, width, depth, flood plain configuration, and gradient, and The new channel incorporates fish habitat components, bed materials, meander configuration, and native or other approved vegetation that provides better protection for fish life than that which previously existed in the old channel. 	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Large woody material placement, repositioning and removal in freshwater areas E 220-110-150 P 220-660-220</p>	<ul style="list-style-type: none"> The following new provisions are added to the existing rules for placement of large woody material: The department will approve the repositioning or removal of large woody material within the watercourse when needed to protect life, the public, property, or when needed to construct or mitigate for a hydraulic project. The department will require a person to place the repositioned or removed wood directly back in the channel unless there are engineering, legal, safety, or environmental constraints. When these constraints are present, the department may approve the placement of repositioned or removed wood in the floodplain, side channels, along banks, or in the marine nearshore. If wood must be removed from the waterbody because of legal or safety constraints, the department will require compensatory mitigation if the removal of the wood diminishes fish habitat function or value. The department will approve placing large wood back in the channel to improve fish habitat. This may include placing channel-spanning logs, creating log jams, or introducing a single large log or rootwads to the channel. Large woody material may be stabilized against buoyant forces and hydraulic drag forces that may mobilize wood during flood flows by pinning, anchoring, or burying woody material in the floodplain. 	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Beaver dam management E New section P 220-660-230</p>	<p>A new section is added for beaver dam removal, breaching, or modification and the design and construction of beaver deceivers and pond water level control devices.</p>	<ul style="list-style-type: none"> Retains Alternative 2 provisions except for the following change: The department would require a professional determination that there is an imminent threat to property or the environment before issuing an HPA for removal of a beaver dam. 	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Pond construction E 220-110-180 P 220-660-240</p>	<ul style="list-style-type: none"> Retains current rules except the following provision is removed because the department cannot enforce the provision: Pond construction activities involving a diversion of state waters shall be dependent upon first obtaining a water right. 	<ul style="list-style-type: none"> Retains Alternative 2 provisions except for the following change: Applicants would be required to demonstrate they have a valid water right to apply for HPA for water diversions. 	<p>Same as Alt. 2 (Minor or no comments)</p>

* Requires Statutory change

WAC Title (E) Existing (P) Proposed	Alternative 2 WDFW Proposed Rule Changes	Alternative 3 Increased Protection for the Natural Environment	Alternative 4 Increased Protection for the Built Environment
<p>Water diversions and intakes E 220-110-190 P 220-660-250</p>	<ul style="list-style-type: none"> Retains current rules except the following provision is removed because the department cannot enforce the provision: The exercise of project activity associated with the diversion of state waters shall be dependent upon first obtaining a water right. 	<ul style="list-style-type: none"> Retains Alternative 2 provisions except for the following change: Applicants would be required to demonstrate they have a valid water right to apply for HPA for water diversions. 	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Outfall structures in freshwaters areas E 220-110-170 P 220-660-260</p>	<ul style="list-style-type: none"> Retains current rules except language is added to reflect statutory changes to the department’s authority to regulate stormwater including the following: The department may not provision HPAs for storm water discharges in locations covered by a national pollution discharge elimination system municipal storm water general permit for water quality or quantity impacts. The HPA is required only for the actual construction of any storm water outfall or associated structures. In locations not covered by a national pollution discharge elimination system municipal storm water general permit, the department may provision HPAs to protect fish life from adverse effects, such as scouring or erosion of the bed of the water body, resulting from the direct hydraulic impacts of the discharge. 	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Utility crossings in freshwater areas E 220-110-100 P 220-660-270</p>	<p>Retains current rules except language is added for utility line design and directional drilling.</p>	<ul style="list-style-type: none"> Retains Alternative 2 provisions except for the following change: The department would require that conduit lines in watercourses would not constrict the channel or preclude future opportunities for bridges or other less-impacting approaches to water crossings. 	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Felling and yarding of timber E 220-110-160 P 220-660-280</p>	<p>Retains current rule provisions.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Aquatic plant removal and control E 220-110-331 E220-110-332 E 220-110-333 E 220-110-334 E 220-110-335 E 220-110-336 E 220-110-337 E 220-110-338 P 220-660-290</p>	<p>Consolidates eight sections into one section, and retains current rule provisions. The only substantial change is the addition of a new section that explains the statutory limits of our authority.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Mineral prospecting E 220-110-200 E 220-110-201 E 220-110-202 E 220-110-206 P 220-660-300</p>	<p>Consolidates four sections into one section and retains the current rule provisions. An additional sub-section is added to allow mineral prospecting on ocean beaches to occur under the Gold and Fish pamphlet.</p>	<p>Retains Alternative 2 provisions except additional timing restrictions would be added.</p>	<p>Retains Alternative 2 provisions except for the timing windows would be changed the 1994 timing windows.</p>

* Requires Statutory change

WAC Title (E) Existing (P) Proposed	Alternative 2 WDFW Proposed Rule Changes	Alternative 3 Increased Protection for the Natural Environment	Alternative 4 Increased Protection for the Built Environment
<p>Tidal reference areas E 220-110-240 P 220-660-310</p>	<p>No change from current rules.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Saltwater habitats of special concern E 220-110-250 P 220-660-320</p>	<p>Retains the current rule provisions for saltwater habitats of special concern except rock sole spawning beds that are removed because rock sole are not obligate beach spawning fish. Olympia oyster settlement areas are added. Nearshore zone geomorphic processes that form and maintain habitat are also added. These include sediment supply and transport; beach erosion and sediment accretion; distributary channel migration; and tidal channel formation and maintenance.</p>	<ul style="list-style-type: none"> Retain Alternative 2 provisions except for the following change: Rock sole spawning beds would be retained as a saltwater habitat of special concern. 	<ul style="list-style-type: none"> Alternative 2 provisions except the following language would be changed to read: “The presence of saltwater habitats of special concern may restrict project type, design, location, and timing.” Remove the phrase “adjacent areas”.
<p>Authorized work times in saltwater areas E 220-110-271 P 220-660-330</p>	<p>Retains current rule work times in Pacific sand lance spawning beds and lingcod settlement and nursery areas. Reduces work times in juvenile salmonid migration corridors and feeding and rearing areas by two months. Retains work times in herring spawning beds except work times are added for two additional tidal reference areas that did not have restrictions. The work time in or adjacent to rock sole spawning beds is removed because rock sole are not obligate beach spawning fish. Where the smelt spawning season is six months or longer, adds a new requirement that work must be started within seventy-two hours of a survey.</p>	<ul style="list-style-type: none"> Retain Alternative 2 provisions except for the following changes: Work times would apply to potential (suspected) as well as documented areas. Apply work times regardless of the expected impact from the work. Add work times for rock sole spawning beds. 	<p>Alternative 4 would retain the Alternative 1 authorized work times. Additional monitoring would be required for projects. This will allow work to continue as previous but will monitor where/when aquatic life is entering the project area.</p>
<p>Intertidal forage fish spawning bed surveys E New section P 220-660-340</p>	<p>This new section requires a biologist who conducts forage fish spawning surveys to complete the department’s forage fish spawning beach survey training. A biologist must follow the department-approved intertidal forage fish spawning protocol and use the standard department data sheets when conducting forage fish spawning beach surveys. New WAC section</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Seagrass and macroalgae habitat surveys E New section P 220-660-350</p>	<p>This new section clarifies when seagrass and macroalgae habitat surveys are required, diver qualifications, and the survey protocol.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Common construction provisions for saltwater areas E 220-660-270 P 220-110-360</p>	<p>Retains current rule language and adds new provisions for staging areas, job site access, equipment use, vessel operation, materials, and demobilization and cleanup.</p>	<ul style="list-style-type: none"> Retain Alternative 2 provisions except for the following changes: The use of treated wood and tires would be prohibited. 	<p>Same as Alt. 2 (Minor or no comments)</p>

* Requires Statutory change

WAC Title (E) Existing (P) Proposed	Alternative 2 WDFW Proposed Rule Changes	Alternative 3 Increased Protection for the Natural Environment	Alternative 4 Increased Protection for the Built Environment
<p>Bank protection in saltwater areas E 220-110-280 P 220-660-370</p>	<ul style="list-style-type: none"> The non-single family and single-family residence bank protection provisions are combined into one section. The current rules are retained except for the following changes: If a new OHWL re-establishes landward of a bulkhead protection structure because of a breach, the department will consider this re-established OHWL to be the existing OHWL if the structure isn't repaired within three years. Design alternatives are listed from the most preferred to the least. An HPA application for new, replacement, or rehabilitated bulkhead or other bank protection work must include a site assessment, alternatives analysis, and design rationale by a qualified professional. This only applies to non-single family bank protection structures. 	<ul style="list-style-type: none"> Retain alternative 2 except for the following changes for single-family residence bulkheads processed under RCW 77.55.141: All bank protection must use the least impacting feasible bank protection design. An HPA application for new, replacement, or rehabilitated bulkhead or other bank protection work must include a site assessment, alternatives analysis, and design rationale by a qualified professional. 	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Residential and public recreational docks, piers, ramps, floats watercraft lifts, and buoys in saltwater areas E 220-110-300 P 220-660-380</p>	<ul style="list-style-type: none"> The current rules are retained for overwater structures except for the following changes: The department will require that new structures are designed with a pier and ramp to span the intertidal beach, if possible. Structures must be located at least twenty-five feet (measured horizontally from the nearest edge of the structure) and four vertical feet away from seagrass and kelp at extreme low water. A structure must have been usable at the site within the past twelve months of the time of application submittal to be considered a replacement structure. The replacement of more than thirty-three percent or two hundred and fifty square feet of decking or replacement of decking substructure requires installation of functional grating. Design requirements are added to reduce impacts from shading and grounding. Provisions are added for the design and construction of mooring buoys and watercraft lifts. Provisions are added for removing creosote piling. A provision is added to require sound attenuation when installing steel piling with an impact pile driver. 	<ul style="list-style-type: none"> Retain Alternative 2 provisions except for the following changes: Prohibit the construction of new docks in documented herring spawning areas. Require 100% grating of docks and floats. Require mooring buoys to be a certain distance from seagrass and macroalgae. 	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Boat ramps and launches in saltwater areas E New section P 220-660-390</p>	<p>This new section lists design alternatives from the most preferred to the least. New design requirement to avoid and minimize impacts to bed, littoral drift cells, and saltwater habitats of special concern.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<ul style="list-style-type: none"> Retain the language in Alternative 2 but delete the following provisions: Design and locate the boat ramp or launch to avoid adverse impacts to saltwater habitats of special concern. The department may require an eelgrass/macroalgae habitat survey for all new ramp or launch construction. A survey is not required to replace an existing structure within its original footprint. Design and locate boat ramps and launches to avoid and minimize excavation below the OHWL.

* Requires Statutory change

WAC Title (E) Existing (P) Proposed	Alternative 2 WDFW Proposed Rule Changes	Alternative 3 Increased Protection for the Natural Environment	Alternative 4 Increased Protection for the Built Environment
<p>Marinas and terminals in saltwater areas E 220-110-330 P 220-660-400</p>	<ul style="list-style-type: none"> The current rules are retained for marinas and rules for marine terminals are added. When possible, locate new marinas and terminals in areas that will minimize impacts to fish life. Locate new marinas and terminals to avoid and minimize impacts to seagrass and kelp. Locate new marinas and terminals in naturally deep areas to avoid or minimize dredging. Locate new marinas and terminals in areas deep enough to avoid or minimize propeller wash impacts to the bed. Locate new marinas and terminals in areas with existing low or impaired biological value. Design and construct marinas and terminals so that most overwater coverage is in the deepest water possible; this is necessary to allow light penetration to the intertidal and shallow subtidal areas. Provisions are added for removing creosote piling. A provision is added to require sound attenuation when installing steel piling with an impact pile driver. Provisions are added for marina and marine terminal maintenance to incorporate a statutory change. 	<ul style="list-style-type: none"> Retain the language in Alternative 2 but add the following provision: New and expanded docks, wharves, piers, marinas, rafts, shipyards and terminals must be at least a specified buffer distance from existing native aquatic vegetation attached to or rooted in substrate. 	<ul style="list-style-type: none"> Retains Alternative 2 except for the following change: Acknowledge the different purposes, requirements, and constraints of bulkheads and other bank stabilization in the marina/marine terminal environment.
<p>Dredging in saltwater areas E 220-110-320 P 220-660-410</p>	<ul style="list-style-type: none"> Retains the current rule provisions for dredging in saltwater areas except the following new provisions are added: The department may require hydrodynamic modeling for new dredging projects and expansions. Design project to avoid dredging and expansions that convert intertidal to subtidal habitat. 	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Artificial aquatic habitat structures in saltwater areas E New section P 220-660-420</p>	<ul style="list-style-type: none"> This new section includes provisions for designing and constructing artificial aquatic habitat structures that must meet one or more of the following needs: Enhance fish viewing opportunity at a specific location; Enhance or conserve aquatic resources; or Mitigate for impacted fish habitat. 	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>

* Requires Statutory change

WAC Title (E) Existing (P) Proposed	Alternative 2 WDFW Proposed Rule Changes	Alternative 3 Increased Protection for the Natural Environment	Alternative 4 Increased Protection for the Built Environment
<p>Outfalls and tide and flood gates in saltwater areas E New section P 220-660-430</p>	<ul style="list-style-type: none"> This new section includes the statutory limits of our authority, and provisions for the design and construction of stormwater outfall and tide and floodgate projects including the following: The department may not provision HPAs for storm water discharges in locations covered by a national pollution discharge elimination system municipal storm water general permit for water quality or quantity impacts. An HPA is required only for the actual construction of any stormwater outfall or associated structures. In locations not covered by a national pollution discharge elimination system municipal storm water general permit, the department may issue HPAs that contain provisions to protect fish life from the direct hydraulic impacts of the discharge, such as scouring or erosion of the waterbody bed. The department may not require a fishway on a tide gate, flood gate, or other associated human-made agricultural drainage facilities as a provision of a permit if such a fishway was not originally installed as part of an agricultural drainage system existing on or before May 20, 2003. 	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Utility crossing in saltwater areas E 220-110-310 P 220-660-440</p>	<ul style="list-style-type: none"> Retains the current rule provisions for utility lines except for the following change: The department may require an eelgrass/macroalgae habitat survey for new construction. 	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Test boring in saltwater areas E New section P 220-660-450</p>	<p>This new section includes provisions to protect water quality during boring projects.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Informal appeal of adverse administrative actions E 220-110-340 P 220-660-460</p>	<p>Retains the current rule provisions.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>
<p>Formal appeal of administrative actions E 220-110-350 P 220-660-470</p>	<p>Retains the current rule provisions.</p>	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>

* Requires Statutory change

WAC Title (E) Existing (P) Proposed	Alternative 2 WDFW Proposed Rule Changes	Alternative 3 Increased Protection for the Natural Environment	Alternative 4 Increased Protection for the Built Environment
<p>Compliance E 220-110-360 P 220-110-480</p>	<ul style="list-style-type: none"> • Retains the current rule provisions and adds the following language for civil enforcement: • The department will develop programs to encourage voluntary compliance by providing technical assistance consistent with statutory requirements. • The department may issue a notice of correction. • The department may issue a civil penalty provided for by law without first issuing a notice of correction only under specific circumstances: • The person has previously been subject to an enforcement action for the same or similar type of violation; or • Compliance is not achieved by the date set by the department in a previously issued notice of correction; or • The violation has a probability of placing a person in danger of death or bodily harm, has a probability of causing more than minor environmental harm, or has a probability of causing physical damage to the property of another in an amount exceeding one thousand dollars; or • The violation was committed by a business that employed fifty or more employees on at least one day in each of the preceding twelve months. 	<p>Same as Alt. 2 (Minor or no comments)</p>	<p>Same as Alt. 2 (Minor or no comments)</p>

* Requires Statutory change

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2.3 Proposed Rule Changes Eliminated from Detailed Study

As described above, development of the revised Hydraulic Code Rules has included several iterations and WDFW has evaluated several different approaches to the rule revisions. The major options considered but not carried forward are described in the following sections along with the reasons for eliminating the alternatives. Generally, alternatives were eliminated because they did not meet the purpose and need for the action; that is, the alternatives below either do not update the rules to reflect evolving fish science and design technology, or do not contribute to better alignment with GMA/SMA provisions or Hydraulic Code statutes. Several of the approaches were rejected because they did not simplify the application process or increase certainty for applicants.

2.3.1 Curtailment of work to develop a Habitat Conservation Plan

As described in Chapter 1, WDFW originally began revising the Hydraulic Code Rules as part of developing an HCP. In 2011, it became apparent to the department it would take several more years to complete the HCP process that began in 2006. The grant funding received to develop the HCP was insufficient to complete the process. If the department continued the HCP development, it would have required the reallocation of scarce field staff resources in 2013-2014 to complete the process. Also, in early 2012, National Marine Fisheries Services and U.S. Fish and Wildlife Service (the Services) indicated that several types of hydraulic projects could not be covered under the HCP because some statutes in Chapter 77.55 RCW prevented the department from meeting the Services' standards for an HCP. This led to the loss of support for HCP development and curtailment of the project.

2.3.2 "Prescriptions Only" Approach

Early in the process, WDFW considered a prescription-only alternative, which would contain only rules, as directed by RCW 77.55.081 and RCW 77.55.091 for removal or control of noxious weeds and for small scale mining and prospecting. With those two exceptions, the Hydraulic Code Rules would not include technical provisions applicable to construction activities. Instead, each proposed hydraulic project would be evaluated on a site-by-site basis. All requirements for each project, (no matter how common or routine that type of project is), would be established through an analysis of the unique conditions present at that specific site. This alternative was contained in the SEPA Scoping Notice issued in June 2012. WDFW eliminated this alternative from further consideration because the complexity and inconsistency that would result from implementing such an approach made the alternative infeasible. In addition, the approach would not provide transparency or regulatory predictability for applicants.

2.3.3 Procedural Alternative

The procedural alternative would have made changes to only the Hydraulic Code Rules that were necessary because of changes to the enabling laws, including recodifications. This approach would have ensured that the rules met statutory requirements; however, it would not incorporate available science or technology, nor would it improve protection of fish life. In addition, it would eliminate the efficiencies gained through general and model HPA permitting processes.

2.3.4 One-Activity-at-a-Time Alternative

This alternative proposed an approach similar to that used by WDFW to update the rules for mineral prospecting. The rules for only one activity at a time would be updated. While this approach could meet the project purpose for the selected activity, it would not improve the application process, would not improve readability of the hydraulic code rules, and would not ensure that the permit program as a whole meets the regulatory standard of protecting fish life.

2.3.5 Most-Commonly-Permitted Activity

This alternative would have changed only the sections of the Hydraulic Code Rules that cover the most-frequently permitted types of construction projects: water crossings, bank protection, and overwater structures. While this approach could have met the purpose and need for the selected activities, it would not improve the application processing or readability, nor ensure that the rules as a whole met the regulatory standard of protecting fish life.

2.3.6 Proposed Single-Rule Changes

In addition to alternatives that were proposed but not carried forward, WDFW received numerous suggestions for individual rule changes that were not incorporated into the proposed rules. Many of those comments were received during the comment period for the Draft PEIS dated September 2013. The comments and agency responses are summarized in Appendix A of the final PEIS.

WDFW received several suggestions for rule changes that would require a change in the statute prior to implementation in rule. Suggestions expressed by multiple stakeholders that were not included in the proposed rules changes (Alternative 2) are included in one of the added alternatives: Increased Protection of Fish Life – Alternative 3, and Increased Protection for the Built Environment – Alternative 4. As noted previously, a few of the Alternative 3 and 4 proposals are not able to be implemented by the Fish and Wildlife Commission because the topic is regulated by statute (legislated law) not rule. Rules adopted by the Fish and Wildlife Commission must be consistent with current statute.

Table 2-7 summarizes the suggested rule changes that would require legislated changes to Hydraulic Code statutes before being implemented by the Fish and Wildlife Commission in rule.

Table 2-7 Suggested Rule Changes that are Inconsistent with Current Statute

WAC Section of Proposed Change	Recommended Change	Statutory Reference
General	Hydraulic code rules should also protect marine mammals, birds, or amphibians.	RCW 77.55.021(1)
WAC 220-660-030(20)	Change the definition of “Chronic danger”.	RCW 77.55.221
WAC 220-660-030(26)	Change the definition of “County legislative authority”.	RCW 77.55.021(12)(a)

WAC Section of Proposed Change	Recommended Change	Statutory Reference
WAC 220-660-030(34)	Change how an emergency is declared and who can declare an emergency.	RCW 77.55.021(12)(a) – (d)
WAC 220-660-030(75)	Change the definition of Hydraulic Project. This is very broad and we have concerns that, with the varied interpretations of different biologists, this could reach far outside of reasonable impacts that affect fish life.	RCW 77.55.011(11)
WAC 220-660-030(78)	Change how an imminent danger is declared and who can declare an emergency.	RCW 77.55.011(12)
WAC 220-660-030(157)	If the agricultural drainage facility is in a natural watercourse that has been used as an agricultural drainage facility since before the modern HPA rules, WDFW should consider the effects of excluding from the definition of hydraulic projects maintenance of "man-made agricultural drainage facilities," whether those are in the waters of the state or not.	RCW 77.55.011(11) RCW 77.55.021(12)(c)
WAC 220-660-040(1)(b)	All hydraulic projects must comply with the applicable requirements listed in chapter 220-660 WAC. After 'all hydraulic projects' add "within waters of the state."	RCW 77.55.011(11)
WAC 220-660-040(2)	Add an (2)(l) subsection to include SEPA exemptions. RCW 119.11 is a state law for SEPA, but WDFW adopted WAC 220-100 that requires all of WAC 220 to be incorporated into all WDFW rule making.	RCW 77.55.011(11) RCW 77.55.021(1) RCW 77.55.021(2)
WAC 220-660-040(2)	Add an exemption for routine maintenance such as mowing, vegetation removal, and removal of debris relating to the levee structure and within the rights of way of any Diking District, and that is governed by regulations, ETLs, Vegetation Management Regulations and variances, under regulations and jurisdiction of the U.S. Army	RCW 77.55.021(1) RCW 77.55.131

WAC Section of Proposed Change	Recommended Change	Statutory Reference
	Corps of Engineers.	
WAC 220-660-050	Add a pamphlet for the removal of impacted fine grained sediments and sand from spawning gravel stream beds deposited there as a result of surface water runoff discharge into streams.	RCW 77.55.011(17)
WAC 220-660-050	Restoration projects should not have to pay the \$150 application fee.	RCW 77.55.321
WAC 220-660-050(3) – (8)	Permit categories could be reduced to three: Standard, Expedited (incorporating common elements of emergency, imminent danger, and chronic danger), and Pamphlet.	RCW 77.55.021(12)(a)-(d) RCW 77.55.021(14) RCW 77.55.021(15)(a)-(b)
WAC 220-660-050(3)-(8)	Rules for standard, emergency, imminent danger, chronic danger, expedited HPAs are too restrictive. In addition, USACE officials are generally always on site at times of flooding, in particular in Skagit County, and are ready to take immediate action. Under these revisions, where there must be notification to the Department in writing of a Declaration of Emergency and a requirement to wait for HPA approval or even a verbal approval before work is authorized, would be in the real world, completely impractical and unworkable. In fact this would be an impediment to effective flood control and protection of life and property...	RCW 77.55.021(12)(a)-(d) RCW 77.55.021(14) RCW 77.55.021(15)(a)-(b) RCW 77.55.021(16)
WAC 220-660-050(3)(b)(i)	Seattle City Light (SCL) developed a Fish and Aquatics Management Plan in support of the relicensing of the Boundary Dam. The Plan was endorsed by settling parties, including WDFW, and describes the comprehensive protection, mitigation, and enhancement program that SCL is implementing under a new license issued by the Federal Energy Regulatory Commission (FERC) in 2013. SCL also operates three other hydroelectric facilities on the west slope of the Cascade	RCW 77.55.181

WAC Section of Proposed Change	Recommended Change	Statutory Reference
	Mountains-the Skagit River, Newhalem Creek, and South Fork Tolt River hydroelectric projects. The FERC licenses for these projects include requirements to improve fish habitat within their respective Project boundaries and watersheds for conservation purposes. Because the non-operational mainstem and tributary measures are designed to benefit native salmonid populations and their habitats, SCL requests that fish enhancement projects undertaken to meet FERC license requirements be considered eligible for a FHEP HPA.	
WAC 220-660-050(3)(b)(i)C	This requirement could preclude many if not all restoration projects if anyone comments in regards to public safety concerns. At what point do we sacrifice salmon for the lowest-skill level of river recreational users?	RCW 77.55.181
WAC 220-660-050(4)	Change how an emergency is declared and who can declare an emergency.	RCW 77.55.021(12)(a)-(d)
WAC 220-660-050(4)(a)(i)	Add "natural" and "built" before environmental at the end of the 1st sentence and throughout document. WDFW adopted WAC 220-100 that's required to be incorporated into all actions, by all WDFW rule making, by WAC 197-11-704. This definition cannot be modified.	RCW 77.55.021(12)(a)
WAC 220-660-050(5)	Change how an imminent danger is declared and who can declare an imminent danger.	RCW 77.55.021(14)
WAC 220-660-050(6)	Imminent dangers are covered under emergency permits, chronic danger permits are mere loopholes provided for chronic problems that are often a result of either poor management, lack of proper planning or inadequate infrastructure. If there is truly imminent risk the project can be addressed under an emergency permit. We request that chronic danger permits be	RCW 77.55.021(15)(a)-(b) RCW 77.55.221

WAC Section of Proposed Change	Recommended Change	Statutory Reference
	removed/deleted	
WAC 220-660-050(6)	Change how a chronic danger is declared and who can declare a chronic danger	RCW 77.55.021(15)(a)-(b) RCW 77.55.221
WAC 220-660-050(12)(b)	By law, WDFW has 45 days from the date a complete application package is received to issue or reject an HPA. The law should be updated to assume project authorization if WDFW exceeds the 45 day time period. That would be consistent with Water Quality Certifications and Coastal Zone Management Certifications issued by the Department of Ecology	RCW 77.55.021(7)(b)
WAC 220-660-050(13)(b)(iv)	At the end of the sentence, after "section" add "in non-NPDES discharges."	RCW 77.55.021(7)(b)(iv)
WAC 220-660-050(14)(a)	The imposed limitation on permit conditions that are "out of proportion to the impacts of the proposed project" itself inappropriately ignores cumulative impacts at the project site, and thereby codifies any existing habitat degradation that may be present. This codification is in itself a perpetuation of degradation, and therefore is, in fact, an impact of the project itself, which must be addressed. The language must therefore be stricken.	RCW 77.55.021(7)(a) RCW 77.55.231
WAC 220-660-050(15)(a)	Delete "may" and add "shall".	RCW 77.55.021(9)(b)
WAC 220-660-050(15)(d)(ii)	Delete "periodic floodwaters alone do not constitute a problem that requires an HPA."	RCW 77.55.021(9)(c)
WAC 220-660-080	The rules should require compensatory mitigation for cumulative impacts to fish life.	RCW 77.55.231
WAC 220-660-080(4)(h)	Do not use existing conditions as the baseline for assessing impacts to fish life from a project.	RCW 77.55.231
WAC 220-660-090	All HPAs should contain the provision that	RCW 77.55.021(9)(b)

WAC Section of Proposed Change	Recommended Change	Statutory Reference
	structures must be removed at the end of their useful life.	
WAC 220-660-180	The entire sand and gravel extraction section from rivers for purposes of collecting construction aggregate should be stricken.	RCW 77.55. This is a lawful type of hydraulic project.
WAC 220-660-380	Boat ramps replace habitat. Consider assessing cumulative impacts of more new structures as part of the decision-making process.	RCW 77.55.231
WAC 220-660-370 WAC 220-660-390	In addition to shielding artificial lights from shining on the water (220-660-140(3) and elsewhere), lights should also be shielded from shining into the sky in order to minimize adverse impacts to birds.	RCW 77.55.021(7)(a)
WAC 220-660-420	Agricultural drainage facilities are exempt but stormwater and industrial features are not. The language should be updated to include all manmade drainage facilities that are wholly created for the purpose of managing surface water.	RCW 77.55.281
WAC 420-660-420	"The department may not require changes to the project design above the mean higher high water mark of marine waters, or the ordinary high water mark of freshwaters of the state." Strike the reference to freshwaters of the state, since this section is about marine waters. More substantively, Ecology is concerned that OHWM, which establishes the landward limit of state waters, is typically 1.5 feet above MHHW (at least in the central and northern Salish Sea). Please explain the basis, rationale, statutory mandate, etc. for the proposed language outlining that WDFW cannot require design changes to outfall structures above MHHW. We think there is a real risk that aquatic resources and functions will not	RCW 77.55.161

WAC Section of Proposed Change	Recommended Change	Statutory Reference
	be adequately protected by this provision.	
WAC 220-660-470	The department should establish a stop-work provision in the enforcement and compliance section.	RCW 77.55.291
WAC 220-660-470	Limit compliance actions to current projects with an HPA.	RCW 77.55.291 RCW 77.15.300
WAC 220-660-470	The department should have higher penalties for non-compliance.	RCW 77.55.291

2.4 Adaptive Management

Adaptive management of natural resources is a process that makes possible

“the acquisition of additional knowledge and the utilization of that information in modifying programs and practices so as to better achieve management goals.”⁴

The adaptive management process uses monitoring to inform decision-makers and reduce uncertainty.

The Alternative 2 WDFW-proposed rule changes represent the culmination of almost a decade’s work to modernize the HPA rules’ science/technology foundation. As such, adoption of Alternative 2 would establish a baseline from which changing science and technology and/or the results of effectiveness monitoring can be compared.

Development of an adaptive management program for the HPA program will commence once a decision is finalized in fall 2014 regarding proposed rule changes.

⁴ (Lindenmayer and Franklin 2002:260).

Chapter 3 Affected Environment

This chapter describes environmental resources potentially affected by adoption of the revised Hydraulic Code Rules. Because the rules will be implemented statewide and the environmental landscape of Washington State varies widely from region to region, a general description of the resource categories is provided. The discussion focuses on the portions of the existing natural and built environments that will be most affected by implementing the revised Hydraulic Code Rules. Because water resources and fish will be most affected, more detail is provided on those topics. This EIS does not include descriptions of the affected environment or impacts to resources unlikely to be affected by the revised Hydraulic Code Rules.

Resources included in this Supplemental Draft PEIS are:

- Fish
- Water Resources
- Earth
- Climate
- Wildlife
- Vegetation
- Land and Shoreline Use
- Recreation
- Cultural Resources
- Social and Economic Issues

3.1 Fish

The freshwater rivers and lakes of Washington State provide habitat for a variety of fish species. The connection of these waters to Puget Sound and the Pacific Ocean provides habitat for a large number of salmon species (“salmonids”). Salmonid populations in general have experienced declines across the state, and several species are listed as threatened or endangered under the ESA or have special status listings in Washington State (See Section 3.2.5). The following sections describe fish and invertebrates found in Washington’s waterbodies. A list of all federally and state listed fish and invertebrates in Washington and their status is provided in Appendix B.

3.1.1 Freshwater Resident Salmonids

Resident salmonids remain in freshwater habitat for their entire life cycle. All resident salmonids require clean, cool water to thrive. Some populations of resident salmonids in Washington State are declining. A number of factors have been attributed to the declines including the loss of suitable rearing habitat, water quality degradation, and loss of clean spawning gravels.

Resident salmonids typically feed on plankton, insects, other invertebrates, and smaller fish. Some of the most important and widespread native species of resident salmonids are rainbow trout, cutthroat trout, bull trout, and Dolly Varden. These species are discussed in more detail below. In addition, there are a number of introduced (nonnative) resident salmonid species in Washington’s lakes and streams

including brown trout, golden trout, Lahontan cutthroat trout, lake trout, eastern brook trout, and tiger trout (hybrid between a brook trout and brown trout).

Rainbow Trout – Rainbow trout are widely distributed in Washington’s lakes and streams and are the state’s most popular game fish. Because of their popularity, natural populations are supplemented by WDFW stocking programs that add over 17 million rainbow trout each year to the state’s lakes and streams. Resident rainbow trout generally grow to a length of 18-24 inches. Rainbow trout include the sub-species of concern known as the red-band trout that is native to Washington State and other parts of the Columbia River basin.

Cutthroat Trout – Resident coastal cutthroat trout are found in streams and ponds throughout much of western Washington. Although they may grow to a length of about 18 inches, in smaller bodies of water they may grow to no larger than eight or nine inches long. One group, or what is referred to as a Distinct Population Segment (DPS), of coastal cutthroat trout, the Southwestern Washington DPS, was proposed for listing as a threatened species under the ESA in 1999; however, this DPS is currently identified only as a federal species of concern. Westslope cutthroat trout, another subspecies of cutthroat trout, are more common in eastern Washington lakes and streams and WDFW stocks them in a number of high-country lakes.

Bull Trout – Although commonly considered trout, bull trout are actually members of the char subgroup of the salmon family. Scientists distinguish char from other salmonids by the absence of teeth in the roof of the mouth and the presence of light colored spots on a dark background on the body (trout and salmon have dark spots on a lighter background). Bull trout living in streams may grow to about four pounds in weight, while those living in lakes can weigh 20 pounds. Some bull trout live out their lives in areas near where they were hatched (resident); others migrate from streams to lakes and reservoirs (adfluvial), from small streams to larger river systems (fluvial), or to and from salt water bodies (amphidromous) a few weeks after emerging from the gravel. While bull trout are known to live as long as 12 years, they reach sexual maturity between four and eight years of age. They spawn in gentle stream reaches with cold, unpolluted water and gravel and cobble substrate. Spawning occurs in the fall after stream temperatures drop. Bull trout were listed as threatened by the USFWS in 2001; critical habitat was most recently identified in 2012.

Dolly Varden – As with bull trout, Dolly Varden are members of the char subgroup of the salmon family. Dolly Varden are found in many rivers and some lakes in coastal areas of Washington. The Dolly Varden is similar in appearance to bull trout, but is generally smaller. Dolly Varden populations have generally been declining, and WDFW has restricted fishing for Dolly Varden in a number of areas. In 2001, the USFWS proposed Dolly Varden for listing as endangered due to similarity of appearance with bull trout and because they occur together only within the area occupied by the Coastal-Puget Sound bull trout DPS (66 Federal Register 1628). A designation of threatened or endangered under the similarity of appearance provisions of the ESA extends the take prohibitions of Section 9 to cover the species. However, under section 4(e) of the ESA, a designation of threatened or endangered due to similarity of appearance, does not extend other protections of the ESA, such as the consultation requirements for federal agencies under section 7 of the ESA.

3.1.2 Anadromous Salmonids

Fish that hatch and rear in freshwater, spend a portion of their life in salt water, and then return to freshwater to spawn are referred to as anadromous. In Washington, the five Pacific salmon species including Chinook, coho, chum, sockeye, and pink salmon as well as steelhead exhibit this migratory life history form. Two other species native to Washington waters, coastal cutthroat trout (also called sea run cutthroat) and bull trout, exhibit a similar migratory life history form, which is termed amphidromous. Unlike strictly anadromous species such as Pacific salmon, amphidromous species often return seasonally to fresh water as subadults sometimes for several years before returning to spawn.

Salmon habitat extends from the smallest inland streams to the Pacific Ocean and is comprised of a vast network of freshwater, estuarine, and ocean habitats. Salmon use freshwater habitats for spawning, incubation, and juvenile rearing. In estuarine habitats, juvenile salmon experience rapid growth and make critical adjustments in the chemical balance of their body fluid as they transition between fresh and salt water. Salmon gain most of their adult body mass in ocean habitats before returning to rivers to spawn.

Throughout their lives, salmon feed on freshwater and marine invertebrate organisms and fishes, while being consumed in turn by a variety of parasites, predators, and scavengers. Juvenile salmon feed on salmon carcasses, eggs, and invertebrates, including invertebrates that may have previously fed on salmon carcasses such as caddis flies, stoneflies, and midges. Thus, returning salmon provide a flow of nutrients into freshwater habitats and play a critical role in the ability of watersheds to retain overall productivity of salmon runs.

Salmon populations have declined significantly over the past several decades such that many salmon stocks in Washington State are now listed by the National Marine Fisheries Service (NMFS) as either threatened or endangered under the federal ESA.

Chinook Salmon – Chinook salmon are the largest of all salmon. There are different seasonal “runs” or modes in the migration of Chinook salmon from the ocean to freshwater. These runs are usually identified as spring, summer, fall, or winter based on when the adult salmon enter freshwater to begin their spawning migration. Freshwater entry and spawning are believed to be related to local water temperature and water flow regimes. An adult female Chinook will prepare a spawning bed, called a redd, in a stream area with suitable gravel composition, water depth, and velocity. An adult female may deposit four to five “nesting pockets” within a single redd. Chinook salmon eggs will hatch 90 to 150 days after deposition and fertilization by males. Juvenile Chinook may spend from three months to two years in freshwater before migrating to estuarine waters as smolts. After a period of rapid growth, the smolts migrate to the ocean to feed and mature. Juvenile Chinook that spend a shorter amount of time in freshwater (weeks to several months) before migrating to the ocean are often referred to as “ocean maturing” as opposed to those that spend an extended amount of time in freshwater before migrating to the ocean, which are referred to as “freshwater maturing”. Chinook remain in the ocean for one to six years, most commonly two to four. Chinook salmon can grow to about 40 pounds in weight; although those with long ocean residence time can sometimes weigh over 100 pounds.

Coho Salmon – Coho salmon spend approximately half of their life cycle rearing in streams and tributaries. The long freshwater rearing period makes coho salmon more dependent on flow and freshwater habitat than salmonids with shorter freshwater rearing times. The remainder of their life cycle up to the point of returning to their stream of origin to spawn and die is spent foraging in estuarine and marine waters of the Pacific Ocean. Most adult coho return as three-year-olds; however, a small number return as two-year-olds. A mature coho is usually about 2 feet in length and weighs an average of about 8 pounds.

Chum Salmon – Chum salmon are large salmon, second only to Chinook salmon in size. They spawn in the lower reaches of rivers and creeks, typically within 60 miles of the Pacific Ocean. Almost immediately after hatching, chum migrate to estuarine and ocean habitats. Thus, survival and growth of juvenile chum depends less on freshwater habitat conditions than on estuarine and marine habitat conditions. They usually arrive at their stream of origin from November to the end of December. Most chum salmon mature in three to five years. A mature chum salmon weighs between 18 to 22 pounds.

Sockeye Salmon – Sockeye salmon exhibit a variety of life history patterns that reflect varying dependency on freshwater environments. Most sockeye spawn in or near lakes where juveniles rear for one to three years before migrating to the ocean. For this reason, the major distribution and abundance of sockeye is closely related to the location of rivers that have accessible lakes in their watersheds, such as the Wenatchee River (Lake Wenatchee) and Cedar River (Lake Washington).

There are also non-anadromous forms of sockeye salmon that spend their entire life in fresh water. Occasionally, some of the juveniles in an anadromous population will remain in their rearing lake environment throughout their lives and will eventually spawn together with their anadromous siblings. In Washington State, non-anadromous sockeye are referred to as kokanee.

Pink Salmon – Pink salmon are the most abundant northwest salmon. They spawn in odd numbered years a short distance up coastal rivers. With only a two-year life cycle, they tend to be small relative to other salmon, averaging three to four pounds and seldom reaching 10 pounds (WDFW 2001).

Steelhead – Steelhead are sea-going rainbow trout. They begin their lives in freshwater rivers and creeks where they rear for two years before migrating to marine waters. Consequently, they are very dependent on flows and freshwater habitat. They reside in marine waters for one to six years (typically two to three years), then return to their home streams to spawn. Unlike salmon that die after they spawn, adult steelhead can return to the sea and repeat the cycle. Adult steelhead typically weigh from 5 to 14 pounds, although those with long ocean residence time may reach about 30 pounds.

Most steelhead spawn from mid-winter to late-spring, however two distinct “runs” of steelhead return to freshwater at different times, a winter run and a summer run. Winter-run steelhead return to Washington streams from November to the end of April. WDFW stocks hatchery winter-run steelhead in about 75 streams to enhance fish populations. Summer-run steelhead return to freshwater from April to the end of September in about 36 Washington rivers and creeks. WDFW plants summer-run hatchery stocks in approximately 45 rivers and creeks (WDFW 2001). In general, summer-run steelhead migrate longer distances to reach their spawning grounds and thus enter freshwater in an immature reproductive state. Winter steelhead, on the other hand, tend to enter streams at an advanced stage of

sexual maturity (gonads fully developed) and therefore do not have to travel as far before spawning. For example, steelhead that migrate into the upper Columbia and Snake River drainage are summer-run steelhead, while most, but not all, runs in Puget Sound drainages are winter-run steelhead.

3.1.3 Other Fish

This discussion of “other fish” is comprised of two subsections: freshwater fish and salt water fish. Some of the fish described below live at least part of their lives in estuaries or portions of rivers affected by tides that are transitional areas between freshwater and marine waters. In addition, native and non-native species, such as white sturgeon, eulachon, longfin smelt, Pacific lamprey, and American shad, are anadromous.

Freshwater Species

Approximately 70 non-salmonid fish species can be found in freshwater bodies of Washington State at some point in their life cycles. Of this number, over 30 species are introduced, including some of the more popular sport fish such as largemouth bass, smallmouth bass, walleye, crappie, yellow perch, channel catfish, tiger muskie, and bluegill. Native freshwater species include sturgeon, the largest freshwater fish species; a variety of minnows such as northern pikeminnow, redbreast shiner, leopard dace, and speckled dace; burbot (a member of the cod family); largescale sucker; Columbia River smelt (eulachon); and several sculpin species (WDFW 2001).

Saltwater Species

A large number of fish species are present in the marine waters of Washington State. Puget Sound alone, excluding the outer Washington Coast, is represented by 71 families of marine fish. A complete list of the marine fishes of Puget Sound can be found at: <http://www.burkemuseum.org/static/FishKey/>. Species of interest, primarily because of importance to recreational and commercial fisheries, include Pacific herring, Pacific cod, walleye pollock, numerous rockfish species, ling cod, and Pacific halibut. Other representative families include sharks, rays, sculpin, sablefish, and gunnels. Marine forage fish including sand lance and surf smelt utilize the intertidal areas of beaches for reproduction and are thus at an increased risk of exposure to development activities along the marine nearshore area. Protection of these and other forage fish species including Pacific herring are important because forage fish provide a source of food for many fish and wildlife species including salmon.

3.1.4 Other Aquatic Organisms

Saltwater habitats associated with Washington’s marine waters support many types of invertebrates, including several recreational and commercial shellfish species. The marine waters of Puget Sound and the Washington Coast contain native and non-native organisms. The following sections briefly describe those species relevant to the Hydraulic Code Rules.

Native Aquatic Organisms

In addition to fish, Washington State is also home to crustaceans (crabs, shrimp, and crayfish), mollusks (snails, clams, and oysters), echinoderms (starfish, sea urchins, and sea cucumbers).

The Dungeness crab, red rock crab, and several species of clams and oysters are also recreationally and/or commercially harvested in Washington. The Pacific oyster, which is the largest component of the commercially harvested oysters in Washington State was introduced from Japan in the early 1900s. The Olympia oyster is native to Washington State and is also a relevant commercial species. Clams include geoducks, razor clams, native and Manila (non-native) littleneck clams, cockles, horse clams, eastern soft-shell clams, macoma clams, and blue mussels. Other invertebrates include shrimp, abalone, nudibranchs, sea stars, sea cucumbers, scallops, snails, Pacific giant octopus, squid, sea urchins, anemone, sand dollars, and polychaete worms.

Freshwater invertebrates are also present in Washington State and include freshwater mussels and snails, aquatic insects, and one native species of crayfish, the signal crayfish. Several non-native and invasive crayfish have also been documented in Washington waters. Aquatic invertebrates are an important food source for fish as well as other aquatic and terrestrial organisms. Aquatic invertebrates include the larval stage of terrestrial insects such as mayflies, stoneflies, caddis flies, dragonflies and damselflies, and mosquitoes. These organisms play a critical role in the food-web of the freshwater aquatic environment because most resident and juvenile salmonids depend on them as a food source.

Many of the native aquatic species also have special status listings either at the Washington State level or under the ESA. A list of these species is included in Appendix B.

Aquatic Invasive Organisms

“Aquatic invasive species” means nonnative species classified by the state fish and wildlife commission under RCW 77.12.020 as prohibited aquatic animal species or regulated aquatic animal species; or by the state noxious weed control board under RCW 17.10.070 as aquatic noxious weeds. Once nonnative species become established in a new environment where natural enemies, pests, or disease that kept them in check in their native environment are missing, they may spread rapidly and cause unanticipated negative biological and economic impacts. Aquatic invasive species in freshwater environments in Washington State include the New Zealand mudsnail (*Potamopyrgus antipodarum*), the Asian clam (*Corbicula fluminea*), and Eurasian water milfoil (*Myriophyllum spicatum*). Invasive species in the marine environment of Washington include the European green crab (*Carcinus maenus*), the oyster drill (*Ceratostoma inornatum*), Cordgrass (*Spartina spp.*), Japanese eelgrass (*Zostera japonica*) and several non-native tunicates including the club tunicate (*Styela clava*), transparent tunicate (*Ciona savignyi*), and colonial tunicate (*Didemnum vexillum*). More information on aquatic invasive species in Washington State can be found at: wdfw.wa.gov/ais/.

3.1.5 Species and Habitats with Special Status

Appendix B lists the fish species and habitats with special status designations under the federal ESA and those with special status in Washington State. Those with special status designations under the ESA include species listed as endangered, threatened, candidate species, species proposed for listing as threatened or endangered, species of concern, and those areas designated or proposed as critical habitat. Critical habitats are those areas that are essential to the conservation of the species. Those with special state status designations are those considered “species of concern” by WDFW, which includes

those species listed as State Endangered, State Threatened, State Candidate, State Sensitive, or State Monitor.

3.2 Water Resources

With approximately 50,000 miles of rivers and streams, 7,800 lakes, and 3,200 miles of coastline, water is an essential resource for the economic, social, and cultural well-being of the state of Washington. These waters provide the necessary physical, chemical, and biological elements to support the numerous fish and wildlife species that inhabit these aquatic habitats. The Washington State Hydraulic Code is intended to protect these resources specifically for the fish that depend on these systems.

3.2.1 Surface Water

The construction of hydraulic projects or any work that will use, divert, obstruct, or change the flow or bed of a watercourse is regulated under the Hydraulic Code Rules. RCW 77.55.011(11) defines "Hydraulic Project" as *"the construction or performance of work that will use, divert, obstruct, or change the natural flow or bed of any of the salt or freshwaters of the state."* RCW 77.08.10 (62) defines "Waters of the state" and "state waters" as meaning *"all salt and freshwaters waterward of the ordinary high water line and within the territorial boundary of the state."* This includes freshwater rivers and streams, lakes, and marine waters and shorelines as described in the following sections.

WAC 220-110-020(105) defines "Watercourse," "river," or "stream" as *"any portion of a channel, bed, bank, or bottom waterward of the ordinary high water line of waters of the state, including areas in which fish may spawn, reside, or pass, and tributary waters with defined bed or banks that influence the quality of fish habitat downstream. This includes watercourses that flow intermittently or that fluctuate in level during the year, and applies to the entire bed of such waters whether or not the water is at peak level. This definition does not include irrigation ditches, canals, stormwater treatment and conveyance systems, or other entirely artificial watercourses, except where they exist in a natural watercourse that has been altered by humans."*

A WDFW-proposed change to the definition of "watercourse" adds *"A watercourse includes all surface-water-connected wetlands that provide or maintain fish habitat."* This is intended to clarify which surface-water-connected wetlands are regulated under the HPA program.

3.2.1.1 Freshwater - Rivers and Streams

The Columbia River, the largest river in the western United States, drains the eastern and southwestern portions of Washington. Because of the large volume of water conveyed by the Columbia River and the substantial change in elevation along its course, a number of hydroelectric dams have been constructed on the river, including 11 in Washington State. As such, many reaches of the Columbia are controlled pools or artificial lakes behind dams, such as Franklin D. Roosevelt Lake behind Grand Coulee Dam. The largest tributary of the Columbia, the Snake River, is also highly developed for hydroelectric power generation with four dams operating in Washington. Other major tributaries of the Columbia River in eastern Washington, listed from upstream to downstream, include the Pend Oreille, Kettle, Colville, Spokane, Sanpoil, Okanogan, Methow, Chelan, Entiat, Wenatchee, Yakima, Walla Walla, Klickitat, and White Salmon river systems. Washington tributaries of the Columbia River in the reach flowing from the

Cascade Mountain Range Divide to the Pacific Ocean include the Wind, Washougal, Lewis, Kalama, Coweeman, Cowlitz, Elochoman, and Grays river systems. A number of large western Washington river systems discharge to Puget Sound, including, from north to south, the Nooksack, Skagit, Stillaguamish, Snohomish, Cedar, Duwamish-Green, Puyallup, Nisqually, and Deschutes. Hood Canal, the western arm of Puget Sound, receives several moderate to large river systems including the Quilcene, Dosewallips, Duckabush, Hamma Hamma, and Skokomish.

Rivers on the north end of the Coast (Olympic Mountain) Range flow into the Strait of Juan de Fuca, that connects Puget Sound with the Pacific Ocean. These rivers include the Dungeness, Elwha, Lyre, and Hoko rivers systems. Rivers on the west side of the Coast Range flow directly into the Pacific Ocean or embayments of the ocean such as Grays Harbor and Willapa Bay. These include the Sol Duc, Hoh, Queets, Quinault, Humptulips, Chehalis, and Willapa river systems.

Streamflow in the state's rivers is primarily determined by the amount and type of precipitation that falls during winter months. Precipitation that falls during the rest of the year is typically returned to the atmosphere through evaporation and transpiration by plants. Stream flows in rivers whose headwaters are at relatively low elevations and that are located in areas where winter temperatures are above freezing for most of the winter respond quickly and directly to rainfall events and generally have a strong winter peak in their annual flow pattern (hydrograph). The Chehalis River is an example of a river exhibiting this type of flow pattern.

Snow is the main form of precipitation feeding rivers whose headwaters are at relatively high elevations and/or are located in areas where temperatures are below freezing for most of the winter. Generally, flows in such rivers are low during the winter, but peak strongly in spring and early summer when snow melts. Most eastern Washington rivers, including the east-slope Cascade rivers, exhibit this flow pattern.

Rivers originating from the higher portions of the Olympic Mountains and the upper west-slopes of the Cascade Mountains have headwaters in areas where snowfall is the predominant form of winter precipitation, but temperatures are above freezing for most of the winter in the reaches below the headwaters. Flow patterns in such rivers typically show a winter peak associated with seasonal rainfall in the mid- and lower reaches as well as a spring or early summer peak associated with snowmelt in the upper reaches (Hamlet et al. 2001). However, rivers that are fed by glacial melt water, in addition to snow pack, will exhibit a different flow pattern. Glaciers can contribute a considerable amount of flow to rivers during late summer and early fall after the snow pack has melted and when precipitation is normally low.

An increase in human development has affected ecological processes in many freshwater bodies within Washington. Development has affected changes in hydrologic, hydraulic, sediment, and temperature regulation/water quality functions.

3.2.1.1.1 Hydrologic Stressors

Hydrologic alteration has occurred in many rivers and streams within Washington. Hydrologic alteration can be defined as any human-caused disruption in any of the five important characteristics of a flow regime: magnitude, frequency, duration, timing (or predictability), and the rate of change (or flashiness)

(Poff et al. 1997). Hydrologic alterations resulting from dam construction and other human activities have negatively impacted the biodiversity and ecological integrity of rivers worldwide (Dudgeon 2000; Pringle et al. 2000).

These consequences of hydrologic alteration have included habitat fragmentation, conversion of lotic (moving-water) habitat to lentic (still-water) habitat, variable flow and thermal regimes, degraded water quality, altered sediment transport processes, and changes in timing and duration of floodplain inundation (Cushman 1985; Pringle 2001). These alterations can result in adverse impacts on crucial life stages of aquatic organisms, such as reproduction, recruitment or migration, and a reduction in riparian and wetland functions. These alterations have occurred through three major pathways including: 1) modifications of the landscape, or watershed, through land-use activities, 2) surface water diversion, and 3) construction of impoundments.

Modifications to the landscape through human-caused land-use activities, including development, forestry, and farming has resulted in negative effects to all the characteristics of a flow regime. A decrease in areas with native soils and vegetation and corresponding increases in impervious surfaces reduces the infiltration, interception, and evapotranspiration of precipitation and can reduce groundwater recharge and increase surface water runoff. This in turn can result in more frequent and abnormally intense peak stream flows, reduced base flows, and other hydrologic effects.

There are currently 1,141 dams in the State of Washington, including 106 dams that are greater than 50 feet in height (Ecology 2013). Many of these dams are located on large river systems, including the Columbia River, and impound substantial quantities of water, which is used for power generation, industry, drinking water, and irrigation. Water releases from these structures often do not coincide with the natural hydrologic regime, resulting in substantial hydrologic alterations.

Similar hydrologic alterations can occur due to stream or lake diversions of water for human uses. These withdrawals alter the hydrologic regime, and can result in extremely low streamflow in the summer months. Groundwater withdrawals can also have similar effects, reducing groundwater recharge capability of streams. Lastly, land-use activities also can alter natural drainage and flood pathways, result in a loss of open channel area, and decrease surface water storage areas through loss of wetlands and floodplains.

Flood risk is a major concern for projects in proximity to the waters of Washington State. Flooding of rivers, streams, and other shorelines is a natural process that is affected by various factors and land uses occurring throughout the watershed. Past land use processes have disrupted hydrological processes and increased the rate and volume of runoff, thereby exacerbating flood hazards and reducing ecological functions.

Flood risk is regulated by local flood-damage-prevention ordinances adopted in compliance with the National Flood Insurance Program. Streambank stabilization measures, shore armoring, and flood risk reduction are regulated by the Shoreline Management Act and the Critical Areas regulations of GMA. Flood hazard reduction measures often consist of structural measures that are regulated by the hydraulic code rules, including dikes, levees, revetments, floodwalls, shore armoring, and channel

realignment. Nonstructural flood hazard reduction measures can also include hydraulic projects such as dike removal and wetland restoration.

3.2.1.1.2 Hydraulic and Sediment Stressors

Human development has also resulted in changes to natural hydraulic and sediment functions and processes. Two of the physical functions affected are slope/bank stability and sediment transport. Development has often resulted in simplified and straightened stream channels confined within levees or dikes, with hardened/armored banks, limited floodplain area or channel migration zone (CMZ), lack of bankside riparian vegetation, and limited or no channel complexity and structure. These simplified channels, which are also usually affected by changes in the hydrologic effects discussed above, can result in dramatic changes in sediment transport processes by altering natural erosion (scour) and depositional patterns and increasing stream velocities. Bank erosion can result, leading to a surplus of fine sediments that can be transported downstream and deposited. Also, altered hydrologic and hydraulic processes, coupled with alteration of riparian areas, can simplify instream structure, including channel form, stream and floodplain roughness, and debris presence and recruitment.

3.2.1.1.3 Stream Temperature and Water Quality

Changes to stream temperature and water quality can also result from human disturbance and development. Cleared riparian zones increase the amount of solar radiation reaching a waterbody, which can result in substantial increases in stream temperature in small and medium-sized waterbodies. Furthermore, when these riparian areas are developed and lack vegetation, the ability of the landscape to infiltrate and intercept chemicals in stormwater runoff is decreased, resulting in greater increases in pollutant loading.

3.2.1.2 *Freshwater - Lakes*

The state has numerous fresh water lakes, the largest of which is Lake Chelan, an approximately 55-mile long glacial lake in north central Washington. The state's lakes include naturally formed lakes, constructed reservoirs on rivers and streams, and natural lakes that are artificially raised and/or controlled through constructed impoundments. Lakes are typically fed by water from inflowing rivers or creeks, but may also be fed by groundwater and direct precipitation.

Increased human development around lake edges has resulted in stressors within lacustrine (lake) systems in Washington.. In addition, many lakes are dammed or the outlet otherwise restricted, affecting hydrology and water quality in some lakes.

3.2.1.3 *Marine Waters and Shorelines*

The major marine water features of Washington State are the Pacific Ocean, the Strait of Juan de Fuca, and Puget Sound, including Hood Canal, collectively called the Salish Sea (Figure 3-1). Additional marine water features are large coastal estuaries including Grays Harbor at the mouth of the Chehalis River, Willapa Bay at the mouth of the Willapa River, and the Columbia River estuary at the mouth of the Columbia River, as well as the straits and bays of the San Juan Archipelago. Fifteen counties have marine shorelines--Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Mason, Pacific, Pierce, San Juan, Skagit, Snohomish, Thurston, Wahkiakum, and Whatcom counties. Collectively, these counties share 2,337

miles of marine shoreline comprised of 157 miles of Pacific coastline, 144 miles of coast along the Strait of Juan de Fuca, 89 miles in Grays Harbor, 129 miles in Willapa Bay, 34 miles in the Columbia River Estuary, and 1,784 miles bordering Puget Sound and the Strait of Georgia. Approximately 73 percent of these shorelines consist of sand or pebble beaches, while 27 percent consist of rocky headlands, marshes, or other shoreline types (Ecology and NOAA 2001).

Increased human development along marine shorelines and increased use of marine waters for transportation has resulted in shoreline armoring and overwater structures (e.g., docks, bulkheads, piers), alteration of drift cell and sediment dynamics (from piers, jetties, breakwaters, and marinas), degraded water quality from stormwater runoff, and degraded nearshore conditions from loss or alteration of estuarine, wetland, and riparian habitats. The loss of estuary habitat due to placing fill and disconnecting floodplain and tidal wetlands in the estuary is also a factor limiting salmon productivity.

3.2.2 Water Quality

Ecology's most recent federal Clean Water Act section 303(d) list was approved by the U.S. Environmental Protection Agency (EPA) in December 2012. The list is part of Ecology's Water Quality Assessment, which groups waters in Washington State into five categories. Category 5 constitutes the 303(d) list, the list of impaired water bodies that generally require a total maximum daily load (TMDL) plan. The list assesses water bodies for over 100 parameters, including temperature, fecal coliform, dissolved oxygen, instream flow, bacteria, and turbidity. Ecology's 303(d) list can be accessed at: http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html.

An EPA report based on 2008 monitoring lists the most prevalent causes of impairment to rivers and streams to be, in order of impact: increased water temperature, high levels of fecal coliform bacteria, low dissolved oxygen, high pH, low instream flow, and high levels of polychlorinated biphenyls (PCBs). For lakes, the most prevalent causes of impairment were high levels of PCBs, presence of invasive exotic species, increased water temperature, low dissolved oxygen, high levels of dioxin, and high levels of fecal coliform bacteria. For marine waters, the most prevalent causes of impairment were high levels of fecal coliform bacteria, low dissolved oxygen, presence of invasive exotic species, high levels of PCBs, and high levels of metals (EPA 2013).

3.2.3 Wetlands

The U.S. Army Corps of Engineers evaluates applications for permits for proposed activities in "Waters of the United States" (including wetlands) throughout the State of Washington under the authority of Section 404 of the Clean Water Act. Two state laws, the state Water Pollution Control Act and the Shoreline Management Act, give Washington Department of Ecology the authority to regulate wetlands.

Under RCW 90.58.030 (Shoreline Management Act of 1971), wetlands are defined as:

"Those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

Washington State's wetlands include the estuarine salt marshes of Puget Sound and the Pacific Coast, riparian wetlands adjacent to rivers and streams as an integral part of riparian habitat, potholes and vernal pools of eastern Washington, and high elevation meadows and fens. Many of the freshwater wetlands of western Washington are associated with ponds, lakes, rivers, and shorelines; however, a significant number of wetlands are "isolated" and not directly connected to other surface water bodies. Such wetlands depend on groundwater discharge and precipitation for their water source. The climate of eastern Washington creates permanent and intermittent wetlands that are typically very different from western Washington wetlands in their origin, seasonality, chemistry, and plant species distribution.

Wetlands in the state are critical to maintaining regional biodiversity. Although wetlands represent only 2.1 percent of the area of the state (Dahl 1990), over two-thirds of all terrestrial vertebrate species in Washington can be considered "wetland users" (Knutson and Naef 1997; Kaufmann et al. 2001).

Wetlands also provide important habitat structure for anadromous and resident fish (Sheldon et al. 2005). Anadromous and resident fish benefit from:

- Ponded or impounded surface waters that are either seasonal or permanent and connected to streams;
- Interspersed land and water or shorelines that provide protection from wind, waves, and predators, and natural territorial boundaries;
- Varying depths of water, such as deep and shallow pools (e.g., shallow waters provide refuge for some young freshwater fish, while the deeper waters provide refuge for the larger adults);
- Overhanging vegetation that regulates water temperature;
- Vegetation cover that provides protection from predation (e.g., overhanging or submerged vegetation, submerged logs and rocks, floating debris); and
- Large woody debris that provides cover and habitat for macroinvertebrates.

Many of Washington's wetlands have been lost since the early 1900s due to development activities such as urban development, utility infrastructure construction, logging, and agriculture. Many of the remaining wetlands in the state have been degraded through alteration of hydrology, sedimentation, and removal of vegetation.

3.3 Earth

The geology of Washington State is very complex and has been shaped by a variety of geologic processes including subduction of the Pacific plate, dormant and active volcanism, and repeated glaciation. These processes have created a complex patchwork of geologic regions that are illustrated on Figure 3-1 and described below.

The far western portion of Washington State is part of the Coast Range region. The Coast Range consists of the Willapa Hills of southwest Washington and the Olympic Mountains, which extend north from the Chehalis River valley and form the Olympic Peninsula. The Puget Trough, a structural depression that extends the length of the state, lies to the east of the Coast Range. The Puget Trough is generally flat, but in places is characterized by hummocky glacial deposits. A substantial portion of the northern half of the trough is occupied by Puget Sound, a marine estuary of the Pacific Ocean.

East of the trough is the geologically complex Cascade Range. This range, which extends the entire length of the state, separates western Washington from eastern Washington. The most prominent geographic feature in the southeast portion of the state is the Columbia Plateau. The plateau is an extensive basin formed by numerous basalt flows. The Columbia and Snake Rivers flow through deeply incised trenches cut into the plateau largely as a result of the Missoula Floods that occurred during the last ice age (approximately 15,000 years ago).

The northeast portion of the state is occupied by several mountainous areas including the Okanogan Highlands, the Kettle River Range, and the Selkirk Mountains, a portion of the Rocky Mountain Range.

According to the Natural Resource Conservation Service's (NRCS) *Washington Soil Atlas*, broad variation in topography, climate, and geologic formations within the state has produced thousands of recognized soil types in the state (Hipple 2013). Common parent materials for soil in Washington include volcanic ash, glacial till, granite, schist, limestone, basalt, and tuff. Portions of southeast Washington are occupied by fertile, windblown dust called loess.

3.4 Climate

Washington's climate varies dramatically from west to east with the western part of the state having a mild, humid climate and the eastern part a more extreme and dry climate. Western Washington has frequent cloud cover and considerable fog and rain. Portions of western Washington on the west side of the Olympic Mountains receive as much as 160 inches per year of precipitation, making that area the wettest in the 48 conterminous states. Precipitation in the Puget trough is much less, typically in the range of 40 to 50 inches per year with approximately 60 to 80 percent of that total falling in the six-month period between October and March. Some areas of western Washington experience the rain shadow effect of the Olympic Mountains and receive significantly less rainfall. For example, average annual precipitation for the City of Sequim is only 16 inches.

Precipitation increases dramatically near the Cascade Mountains. Palmer, a site approximately 20 miles west of the Cascade crest, receives an annual average of 90 inches of precipitation. In an average year, Snoqualmie Pass, located at the Cascade crest, receives 104 inches of precipitation, although much of that precipitation falls in the form of snow.

Temperatures in western Washington are moderate. Typical average maximum temperatures in July are about 70°F in coastal areas, and 5 to 10 degrees warmer inland. Average minimum temperatures in July are generally in the low to mid-50s (F). Average maximum temperatures in January are in the mid-40s (F) with average minimum temperatures in the low 30s (F).

Many parts of eastern Washington receive less than 10 inches of total annual precipitation, and much of that precipitation falls in the form of snow. Total precipitation approaches 20 inches per year in areas closest to the Cascade Range and the Selkirk Mountains.

Temperature ranges in eastern Washington are more extreme than those of western Washington. Average maximum temperatures in July are in the mid-80s (F) to near 90°F. Average minimum temperatures in July are generally in the mid- to upper 50s (F). Average maximum temperatures in January are in the low to mid-30s (F), except in southeast Washington where the average maximum

temperatures are closer to 40°F. Average minimum temperatures in January are typically in the teens to mid-20s (F).

3.4.1 Climate Change

According to the *Washington Climate Change Impacts Assessment*, average annual temperatures in the Pacific Northwest are anticipated to increase by 2.0° F by the 2020s, 3.2°F by the 2040s, and 5.3°F by the 2080s. Increases in temperature are projected to reduce snowfall, resulting in decreasing snowpack in Washington by 28 percent by the 2020s, 40 percent by the 2040s, and 59 percent by the 2080s.

Changes in the magnitude of snowpack and timing of snowmelt will shift stream flow timing. Stream temperatures would rise, impacting quality and extent of fish habitat. By the 2080s, periods of thermal stress for salmon would double or possibly quadruple in duration. Increases in thermal stress are projected to be greatest in the Interior Columbia River Basin and the Lake Washington Ship Canal (Climate Impacts Group 2009).

Sea level rise associated with climate change is expected to increase bluff erosion and shift coastal beaches inland. Major ports will likely be able to accommodate rising sea level at their facilities but adapting low-lying coastal transportation networks that serve port facilities (e.g., trains, highways) will be a significant challenge. Shellfish production in the state may be negatively impacted by increasing ocean temperatures and acidity, shifts in disease and growth patterns, and more frequent harmful algal blooms. (Climate Impacts Group 2009).

3.5 Wildlife

Washington's diverse wildlife species inhabit an equally diverse variety of habitats ranging from desert to rainforest in the terrestrial environment, and mountain spring to ocean in the aquatic environment. Wildlife most pertinent to the Hydraulic Code Rules includes species that use freshwater and saltwater bodies and their riparian or shoreline vegetation for nesting, breeding, foraging, and refuge. The following sections describe groups of species and particular wildlife that rely on Washington's aquatic habitats. A list of all federally and state listed wildlife in Washington and their status is provided in Appendix B.

3.5.1 Marine mammals

Three kinds of marine mammals—cetaceans (whales, dolphins, and porpoises), pinnipeds (seals and sea lions), and mustelids (sea otters)—occur within the project vicinity. All marine mammals are federally protected under the Marine Mammal Protection Act, regardless of their listing status under ESA.

Over 20 species of cetaceans are present in the marine waters of Washington State. Six of these species are federally listed under the ESA, including killer whale (orcas), gray whale, humpback whale, blue whale, sperm whale, sei whale, and Northern Pacific right whale. Many of these species such as blue whale and sei whale are relatively rare visitors to the Salish Sea and generally inhabit areas of the continental shelf where they migrate along the Pacific coast between their breeding grounds and feeding grounds. Other species such as orcas spend considerable portions of the year within the Salish Sea and inner coastal waters.

Cetaceans are either filter feeders that use their baleen to strain plankton and other tiny organisms from the water, or toothed whales that feed primarily on fish, squid, and crustaceans. Larger toothed whales also eat aquatic birds and mammals, including other cetaceans (Nowak 1999; Reeves et al. 2002). Pinnipeds found in Washington State include Northern fur, Northern elephant, and harbor seals; and California and Steller sea lions. Seals and sea lions generally feed on fish, squid, octopus, and shellfish, and crustaceans. Harbor seals are considered a non-migratory species, breeding and feeding in the same area throughout the year while other pinnipeds are migratory, moving hundreds or thousands of miles from their breeding grounds in Mexico, Canada, Oregon, and Washington. Although California and Steller sea lions do not breed in Washington waters they utilize portions of Puget Sound and the lower Columbia River, where they feed on salmon. Pinnipeds temporarily leave the water between periods of foraging along shorelines, and often congregate on haulouts such as beaches, logbooms, docks, and floats.

Sea otter, a mustelid, is also found in Washington. Previously widely distributed within the state, they now almost exclusively occupy rocky habitat along the Olympic Peninsula coast and western Strait of Juan de Fuca (Lance et al. 2004). Sea otters feed primarily on shellfish such as sea urchins, clams, crabs, and mussels.

3.5.2 Amphibians

Amphibians include frogs, toads, newts, and salamanders that inhabit a wide variety of habitats, with most species living in terrestrial or freshwater aquatic ecosystems. In Washington, most amphibian larva live in water. The young generally undergo metamorphosis from larva with gills to an adult air-breathing form with lungs. Amphibians use their skin as a secondary respiratory surface but some small terrestrial salamanders and frogs lack lungs and rely entirely upon skin. Tadpoles and aquatic amphibians utilize gills for respiration. Some amphibian species are fully aquatic throughout life, some take to the water intermittently, and some are entirely terrestrial as adults.

In Washington, several species of frogs and toads are closely associated with open water areas such as streams, lakes, and wetlands, and riparian areas (Johnson and O'Neil 2001). These include bull frog, Cascades frog, northern red-legged frog, Pacific chorus frog, Western toad and Oregon-spotted frog. Oregon spotted frog is listed as a candidate species under the ESA.

Although salamanders reproduce in Washington's freshwater streams and ponds, the adults of most salamander species are also closely associated with open water areas such as streams, lakes, wetlands, and riparian areas (Johnson and O'Neil 2001). Salamander species present within Washington include Long-toed salamander, Northwestern salamander, Pacific giant salamander, Dunn's Salamander, Van Dyke Salamander, Western Red-backed salamander, Cascade torrent salamander, and Olympic Torrent Salamander (Jones et al. 2006). The rough-skinned newt is also found in Washington. None of these species is listed under ESA, although some species of salamander are federal species of concern and/or state candidate species.

3.5.3 Reptiles

Reptiles are a class of cold-blooded egg-laying vertebrate animals with scales or scutes (bony plates). They include lizards, snakes, and turtles. Of these species, turtles are most associated with marine and

freshwater habitats. Several species of turtles inhabit aquatic and terrestrial habitats within Washington.

Sea turtles include the leatherback sea turtle, loggerhead turtle, green turtle, and Olive Ridley sea turtle. Although all of these species are known to inhabit offshore areas of the Columbia River mouth and Puget Sound, they are rare within Washington waters with no known significant nesting (breeding) locations. Only the leatherback sea turtle has been sighted in Puget Sound (Strait of Juan de Fuca). All four of these species are listed as threatened or endangered under the ESA.

Washington has only two native land-based turtles, the painted turtle and the Western pond turtle, both of which live exclusively in freshwater ponds and streams. Western pond turtle is classified as a state endangered species.

3.5.4 Birds

Hundreds of bird species are documented as spending at least a portion of their lives in Washington. The following discussion focuses on those groups of birds most closely associated with freshwater and marine aquatic habitat.

Waterfowl include swans, geese, and ducks, that are mid-sized to large birds most commonly found on or near water. Most waterfowl feed while on the water, diving or submerging their bodies to search for fish, plants, and invertebrates. Approximately 50 species of waterfowl are found in Washington State.

Loons are large, fish-eating birds with spear-shaped bills and long, thickset necks. They are expert divers, able to dive to depths of approximately 250 feet and remain underwater for long periods. All loon species nest on fresh water shores, but in winter are found most commonly on saltwater. There are only five species of loons worldwide, and all five have been seen in Washington (Seattle Audubon Society 2013).

Six species of grebes are found in Washington. Grebes are water-dwelling diving birds with thick, waterproof plumage and that consume fish, aquatic insects, and other small water creatures. During the breeding season they can be found on marshy ponds, where they build floating nests and in the winter, grebes live on open water.

Albatrosses and petrels, also known as tube-nosed seabirds, spend much of their life on the open ocean foraging from the water's surface. For most species, the nesting season is the only time of the year that they touch land. Four species of albatross, 12 species of shearwaters and petrels, and four species of storm-petrels utilize nearshore and offshore areas in Washington.

Pelicans and cormorants are aquatic, medium-sized to large birds that feed on small fish and other aquatic animals and that mostly nest in colonies. Representatives of five of the order's six families have been found in Washington, including one species of tropicbirds, two species of boobies, two species of pelican, and one species of frigate bird.

Hérons and ibises are large birds with long legs and necks. Many live on or near water where they wade in search of prey and many breed in colonies. Herons and egrets are generally wading birds that generally inhabit wetlands and slow-moving waters. Nine different species of herons have been observed in Washington, as have three species of ibis, tactile feeders that generally inhabit wetlands

and use their long, often curved bills to probe in shallow water or mud for invertebrates or small vertebrates.

Rails, coots, and cranes are members of a diverse group of mostly aquatic or marsh-dwelling birds. Despite their wet habitat, members of this order do not have webbed feet, although in some groups their strong toes are slightly webbed or lobed. Coots and rails are generally omnivorous wetland dwellers that use a variety of foraging techniques. Four species of coots and rails are found in Washington on both sides of the Cascade Mountains (Seattle Audubon Society 2013). A single species of crane, the sandhill crane, is found in Washington. These cranes nest in wetlands that are surrounded by lodgepole pine, ponderosa pine, grand fir, or Douglas fir forests.

The order Charadriiformes is well represented in Washington, and includes shorebirds, gulls, and auks. Most of this group consists of water birds that feed on invertebrates or small aquatic creatures. This group include plovers (nine species in Washington State), oystercatchers (one species), stilts and avocets (two species), sandpipers and phalaropes (approximately 40 species), gulls and turns (approximately 30 species), skuas and jaegers (four species), and auks, murres, and puffins (14 species) (Seattle Audubon Society 2013).

3.5.5 Beavers

Beavers are widely distributed across Washington State along rivers, small streams, lakes, and wetlands where there is deep, calm water or adequate year-round flow. Beavers build dams across streams and other watercourses to impound water and create deep-water protection from predators, access to food supplies, and underwater entrances to dens. Beavers can have substantial effects on streams and riparian habitat. Through dam building and feeding, beavers alter hydrology, channel geomorphology, biogeochemical pathways, and community productivity (Naiman et al. 1986).

Beaver ponds and associated wetlands provide fish rearing habitat and habitat for birds and mammals (Bisson et al. 1987; Brown et al. 1996; McCall et al. 1996). Ponds also provide surface water and bank storage that can improve summer instream flow and benefit fish. Multiple studies have noted the interaction that used to exist between beavers and riparian areas and streams prior to the elimination of beaver in many locations (Naiman et al. 1986; Gurnell 1998). Changes in hydrologic regime can also affect beaver populations. For example, streams with higher and more frequent peak flows affect dam building and stability. Persistent breaching or removal of a beaver dam can increase the risk of negative impacts to fish habitat.

3.5.6 Other Species that Utilize Riparian Habitats

Throughout the state, riparian habitat occurs in areas adjacent to rivers, streams, seeps, and springs. Riparian areas provide diverse and productive habitat for wildlife because of the availability of water, moist rich soils, and a variety of plants. In addition to being essential for healthy fish populations, approximately 85 percent of the state's terrestrial (land) animals use riparian habitat for essential life activities (WDFW 1998).

Riparian habitats provide large mammals (e.g., opossum, beaver, fox, mink, otter, elk, and deer) with prey and carrion, a productive and varied plant community, reduced winter snow accumulation,

vegetation in early spring, aquatic habitat, and transportation corridors (Raedeke et al. 1988). Forested riparian habitat offers snags that provide shelter for cavity-nesting birds and mammals (e.g., woodpecker, chickadee, wren) and a food source for tree-clinging, insect eating birds (e.g., nuthatches). Amphibians, reptiles, and small mammals find shelter in or under downed trees and under dense vegetation. Large animals such as deer, elk, and moose can seek refuge from intense summer heat in relatively cool riparian zones (WDFW 1998).

The size of the riparian area and the extent of interaction between the land and the water vary with the size of the stream (Bilby 1988). Riparian habitat along smaller headwater streams is usually insufficient to support large mammals. Lowland riparian areas along large rivers once provided productive wildlife habitat, but has been highly modified by humans. Aquatic species such as otter, beaver, muskrat and mink are most affected by changes in size and composition of riparian areas (Raedeke 1988).

3.6 Vegetation

The flora associated with watercourses in Washington differs between the east and west side of the Cascade Mountain range and between fresh and salt waters. As distance from the watercourse and elevation increase, changes in soil, moisture, temperature, precipitation, and other factors combine to create conditions that are suitable for different plants.

3.6.1 Riparian Species – Native and Invasive

Riparian areas on the west side of the state are extensions of a temperate rain forest and support species such as black cottonwood, red alder, and western red cedar. A dense shrub layer is typically present (e.g., Indian plum, oceanspray, salal) and the floor of the forest has a dense coverage of ferns and mosses. East of the Cascades riparian areas are dominated by willow species, black cottonwood, and other deciduous shrubs and are adjacent to ponderosa pine forests, shrub-steppe or grassland environments. Many watercourses east of the Cascades are void of riparian vegetation due to previous land activities and development.

Riparian vegetation communities present along the shores of Puget Sound are very diverse. Some of the more common trees and shrubs are the same as those found in freshwater riparian areas such as Douglas fir, Pacific madrone, vine maple, oceanspray, and salmonberry. Alder and vine and big-leaf maple forest communities commonly occur along the shores of Puget Sound. Salt-tolerant vegetation found in the backshore of beaches or in mudflats includes saltgrass and saltweed, pickleweed, seaside arrowgrass, and dune wildrye. Marine riparian vegetation communities are particularly important because they exhibit greater biodiversity than inland vegetation communities and influence the health and integrity of marine habitats and species (Brennan 2007). Riparian areas maintain local biodiversity, and their ecological functions provide the basis for many valued fisheries, in addition to bird and other wildlife habitat (National Research Council 2002).

3.6.2 Aquatic Species – Native and Invasive

Freshwater aquatic environments support native and invasive vegetation including algae. Floating plants can have leaves on the surface and be rooted to substrates (e.g., water lilies, pondweeds); tangled mats of stems, leaves, and flowers also rooted to substrates (e.g., water primrose or purslane,

water pennywort); or entirely free floating (e.g., duckweed). Other species of pondweed, waterweed, startwort or bladderwort can grow entirely underwater at shallow depths. Several species of freshwater aquatic plants are considered invasive as they overrun habitats and crowd out native species, such as Eurasian watermilfoil.

Saltwater environments contain seagrasses, kelp, sea lettuce, and other macroalgae species. Eelgrass is rooted seagrass that spreads horizontally at shallow water depths throughout intertidal and subtidal zones. Beds of *Zostera marina* and *Z. japonica* (an invasive species) are found throughout much of the Puget Sound shoreline growing in muddy and sandy substrates (Mumford 2007). Kelp is a large seaweed present in intertidal and subtidal zones. Twenty-three species of kelp are found in Puget Sound, making it one of the most diverse kelp floras in the world (Druehl 1969). Sea lettuce (several species of the genus *Ulva*) grows in shallow bays and inlets and can grow, break off, and accumulate rapidly in thick piles driven by winds and currents during summer months. All types of seaweeds are essential components of the Puget Sound ecosystem. They provide food for several species of sea birds, fish, and other marine animals, as well as shelter for fish.

3.7 Land and Shoreline Use

Land use in Washington State is highly diverse. Portions of the Cascade Range and the Olympic Mountains are dedicated to federally owned wilderness areas, national parks, national recreation areas, and national forests. Approximately 30 percent of land in the state is federally owned. The national forests are managed for multiple uses including commercial timber production and recreation. Private forest lands are common in mountainous areas such as the coast range, Cascades, and northeast Washington. Land privately managed for timber production (e.g., Weyerhaeuser, Georgia Pacific, and Plum Creek) also accounts for 9.4 million acres (43 percent) of Washington's forest lands (Erickson and Rinehart 2005).

The lowlands of Puget Sound are heavily urbanized and include some of the state's largest cities such as Seattle, Tacoma, Everett, Bellingham, Bremerton, and Olympia. Areas around Spokane, Richland, Kennewick, Pasco, Yakima, and Wenatchee in eastern Washington are also characterized by urban-level development. These urbanized areas are home to much of the state's population, as well as its manufacturing, commercial, and service industry base.

The state is also the site of extensive agricultural development. In western Washington, agricultural development is concentrated in the major river valleys, particularly those in the Puget Sound region. Major portions of eastern Washington have been developed for agricultural production. The Yakima, Wenatchee, and Okanogan River Valleys and the Columbia Basin in the central part of eastern Washington contain large scale irrigated agriculture. Southeast Washington is extensively developed for dry-land farming of primarily wheat.

Land use in riparian areas is managed by local zoning and critical areas ordinances, the Growth Management Act (Chapter 36.70A RCW) and the Shoreline Management Act (Chapter 90.58 RCW). The Growth Management Act requires affected cities and counties to designate their rural areas and urban growth areas and to conduct capital facilities planning to ensure that adequate public facilities are provided concurrent with future growth within designated urban growth areas. The Growth

Management Act also requires all counties and cities to develop and adopt development regulations to protect critical areas such as wetlands, fish and wildlife habitat, and aquifer recharge areas. The Shoreline Management Act requires cities and counties to adopt local master programs, which must be approved by Ecology. Shoreline Master Programs are intended to protect shorelines from development and to require mitigation of impacts where appropriate. Local Shoreline Master Programs are required to include regulations for shoreline stabilization measures and in-water work. More information on land use regulations is included in Section 1.5.5 of this document.

3.8 Recreation

Waters of the State of Washington are used extensively for recreation. People enjoy sightseeing, waterfowl watching, hunting, fishing, and other water oriented activities. Water activities include swimming or wading, motor boating, water skiing, personal water craft use (e.g., jet skis), sailboating, non-motorized boating (kayaking, canoeing, or rowing), white water rafting, inner tubing, wind surfing, surfboarding, scuba diving, and beachcombing.

Water-oriented recreation in Washington often revolves around docks, piers, and marinas. Both publicly-owned and privately-owned marinas are common in Washington State. New docks are regulated by the Shoreline Management Act, which includes a policy preference for joint-use docks. However, privately-owned docks associated with single-family residential uses remain more common in the state.

Water recreation in and around smaller streams can include the construction of “play” structures along the shoreline. Some “water play” involves impounding streams (construction of “recreational dams”) to enhance the depth of a swimming hole. These recreational structures can impede fish migration within the creek as flows decline into the fall months. In some cases, spawning migrations are impacted, reducing fish productivity.

Recreation that depends on healthy fish life is of major economic value in Washington, particularly in more rural areas. USFWS estimates in its 2011 report⁵ that expenditures for recreational fishing in Washington top \$974,615,000. Protecting fish resources is vital to the ecological health and community sustainability of Washington.

3.9 Cultural Resources

Cultural resources consist of archeological, historic, and traditional cultural places including buildings, structures, sites, districts, objects, and landscapes. The State Department of Archeology and Historic Preservation (DAHP) has recorded over 20,000 archeological and traditional cultural places and over 100,000 historic properties within the state. This information is maintained in the Washington State Inventory of Cultural Resources.

⁵ 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation U.S. Fish and Wildlife Service publication FHW/11-WA, Issued June 2013

Under the State Environmental Policy Act, potential significant adverse impacts to historic, archeological, and traditional cultural places associated with project actions must be identified and evaluated. The DAHP is responsible for providing formal opinions to local governments and other state agencies on a site or property's significance and the potential impact of a proposed project action upon such sites or properties. Similarly, the National Historic Preservation Act requires that all federal agencies consider cultural resources as part of all licensing, permitting, and funding decisions. Governor's Executive Order 05-05 requires that Washington state agencies integrate DAHP and tribes into their capital planning processes in order to protect cultural sites.

Many of the state's rivers and other surface water bodies have cultural significance to some population groups, including Native American tribes. Rivers and their tributaries can be viewed as being analogous to the bloodstream of a watershed and have great importance on both a practical and spiritual level. For this reason, riparian and marine areas often have a higher likelihood of presence of historic and cultural resources.

3.10 Social and Economic Issues

In addition to forestry and agriculture (as discussed in Section 3.8), major industries in Washington State include computer software, aircraft, electronics, aluminum production, real estate, and retail sales. Other major industries in the state that rely on access to water include hydroelectric power generation, tourism, recreation, and importing and exporting.

The rivers, lakes, and marine waters of Washington State are central to many social and economic drivers in addition to the many businesses that depend on access or proximity to water. Single-family residences and undeveloped residential plots are often located near water. The economy of Washington also depends on its transportation infrastructure, much of which (including state and federal roads, bridges, railways, and the Washington State Ferry system) is located in or near waters regulated by the Hydraulic Code Rules.

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Chapter 4 Regulated Activities and Effect on the Environment

This chapter describes the impacts that may result from adopting the revised Hydraulic Code Rules. Because this is a Supplemental Draft Programmatic EIS that is evaluating the general impacts of implementing the proposed rule changes, potential impacts are discussed generally. Specific hydraulic projects that require an HPA would be evaluated under the new Hydraulic Code Rules if the changes are adopted. This chapter compares the impacts of implementing hydraulic projects under Alternative 1 - the No Action Alternative (existing rules), Alternative 2 – WDFW-Proposed Rule Changes (Preferred Alternative), Alternative 3 - Increased Protection for the Natural Environment, and Alternative 4 - Increased Protection for the Built Environment.

Because the Hydraulic Code Rules apply only to projects that affect the natural flow or bed of state waters, the resources that would be most affected are fish, earth, and water resources. Potential impacts to those resources are discussed in more detail below, with most of the foundation provided under the Fish section. Other resources that would be less affected or only indirectly affected by the proposed rule changes are discussed in less detail.

Impacts of Alternative 2, Alternative 3, and Alternative 4 are evaluated through a comparison with Alternative 1, No-Action. A detailed comparison of impacts between the four alternatives is provided in Table 4-4. In addition, tables are provided for each element that summarizes the level of risk of additional impacts for each of the proposed alternatives. Unless otherwise stated, we assume for these evaluations that the total number of individual HPA projects per year would not vary significantly among the options. Note that provisions identified in Table 2-6 as requiring statutory change are not evaluated in this section.

4.1 Fish

There have been significant gains in knowledge over the last decade with respect to how activities within our waterways affect fish life. Since the last revisions were made to the Hydraulic Code Rules, gains have been achieved in minimizing these effects by implementing specific design criteria, using avoidance measures where appropriate, implementing construction related Best Management Practices (BMP), and adhering to allowable work windows aimed at protecting all life stages of fish, primarily salmonids. The following text outlines potential impacts to fish resulting from activities regulated under the proposed changes to the Hydraulic Code Rules. The impacts discussion is based primarily on the Fish Life Concerns included for each activity in the proposed Hydraulic Code Rules, supplemented with additional information where necessary.

4.1.1 Freshwater Impacts of Hydraulic Projects on Fish

Constructing or performing work activities in or near watercourses can alter the habitat that fish and shellfish depend on. Direct damage or loss of habitat causes a direct loss of fish and shellfish production. Damaged habitat can continue to cause lost production of fish and shellfish for as long as the habitat remains altered. Work activities can also alter the physical processes that form and maintain

fish habitat such as hydrologic patterns and sediment movement. Impacts associated with hydraulic projects include:

- Alteration of light regime
- Aquatic vegetation modifications
- Alteration of fish migration patterns
- Disturbance of streambank or lake shoreline
- Direct loss of fish habitat
- Riparian vegetation modifications
- Disturbance of substrate
- Alteration of stream morphology
- Alteration of sediment delivery and movement
- Alteration of hydrologic patterns
- Alteration of beaver dams

4.1.1.1 Impacts to freshwater fish habitat

Alteration of light regime – Structures such as piers, floats, ramps, or marinas and terminals over freshwater shoreline habitats result in reduced light or shading of fish habitat, which reduces the survival of aquatic plants. Aquatic plants provide food, breeding areas, and protective nurseries for fish. Marinas and terminals have a larger impact area than residential docks and they are usually associated with heavy boat traffic and human use.

The shading and light reduction created by overwater structures may alter predator/prey relationships. Overwater structures may contribute to attracting and congregating juvenile salmon, for example, and may also provide ambush habitat for their predators, such as smallmouth and largemouth bass. Overwater structures, especially if coverage is dense along the shoreline, may reduce phytoplankton primary productivity and therefore negatively affect food-web interactions and productivity higher in the food chain.

Aquatic vegetation modifications – New structures and associated vessel activity can disturb or directly remove aquatic vegetation, which can affect fish life. Marinas and terminals have a larger impact area than residential docks and they are usually associated with heavy boat traffic and human use, which can cause fish to avoid the area.

Alteration of fish migration patterns – In-water structures can alter the movement of juvenile salmon, steelhead, and other fish species. The structure itself can physically block migration or force fish into deeper water, and changes in areas of light and dark can affect migration and increase risk of predation. Boat ramps and launches placed above bed grade can block sediment and wood movement, and alter nearshore migration of juvenile fish. Piers may increase the exposure of juvenile salmon, steelhead, and other small fish to potential predators by providing predator habitat and by changing migration patterns from shallow to deeper water. This can alter the natural predator/prey relationship.

Fishways such as ladders or weirs can impact the migration of some fish. Fish passage structures that target one species or group of species may unintentionally limit the passage of other important species.

Species selection can alter species composition and community relationships upstream of the passage barrier, with important implications for conservation of individual species and biodiversity.

Off-channel ponds created for livestock watering, irrigation, fire protection, or another purpose can provide beneficial habitat or can have detrimental effects on fish. Ponds can disrupt fish movement and also support elevated temperatures that are harmful to fish life. However, these areas can provide important refugia from high flow events and important rearing habitat in cases where off-channel habitat (areas of low energy) is limiting.

Certain activities may create physiological barriers to fish migration. For example, construction activities that create large amounts of turbidity may delay migration.

Disturbance of streambank or lake shoreline - Activities that install permanent or temporary structures for the purpose of protecting or stabilizing a streambank or lake shoreline can result in loss of habitat or alter the bed or beach and the physical processes that form and maintain fish habitat. Direct loss of habitat may include loss of cover, spawning beds, large woody material, riparian function, floodplain connectivity, and alteration to the channel/beach, any of which decreases the complexity and diversity of fish habitats.

Direct loss of fish habitat - Structures that displace river or lakebed habitat used by fish and shellfish include boat ramps or launches, marinas and terminals, water diversions and intakes, and outfall structures. Bridges and piers can also cause the loss of river or lakebed habitat. The larger the number of these structures in a given area, the greater the loss and fragmentation of habitat.

Riparian vegetation modifications - Construction along streambanks or shorelines can disturb or remove riparian habitat. For example, streambank and shoreline stabilization projects may disturb the riparian zone during construction. The installation of outfalls can cause a direct loss of bank side riparian habitat to accommodate the structure or during construction. Removing sand and gravel from the streambed may also involve extensive clearing of vegetation. These activities decrease loading of large woody material in the channel, which is important as cover for fish, and short term loss of macroinvertebrates that are food for fish. Road widening and new roads; power line corridors; residential, commercial, and industrial development; trails; utility infrastructure; agriculture; and other activities have the potential to disturb and degrade riparian conditions.

Disturbance of substrate – Activities that disturb freshwater or nearshore substrates include installing piles for piers, boat ramps, or boat launches; dredging to improve vessel navigation or moorage; sediment traps for flow conveyance and flood abatement; and dredging to clean up contaminated sediments. Dredging in lakes converts shallow-water habitats into deeper-water habitats and may create a steeper bottom transition. This may change the size and species distribution of fish in the localized environment, altering predator/prey dynamics. The effect of dredging on rivers is more complex because localized alteration of channels can lead to dynamic shifts in channel form as the system adjusts to the changed conditions. Dredging may result in a loss of spawning gravel. These effects can extend a considerable distance beyond the bounds of the original dredging project.

Alteration of stream morphology – Activities that remove sand and gravel from streambeds can change the channel shape and bed elevation and may cause flow diversion, sediment stockpiling, and

excavation of deep pits. Removing sand and gravel can also produce a local sediment shortage that can reduce spawning potential and success in gravel-starved stream reaches. Loss of gravel bar head control can create significant channel head cutting upstream of the project.

Bank protection can prevent the stream channel from naturally migrating across the floodplain. This can eliminate sources of woody material, sediment, and side channels. Natural channels evolve over time and migrate across their floodplains. When a channel naturally moves to a new alignment, it leaves behind vital habitat, such as floodplain sloughs and side channels. If the natural fluvial processes of a stream are restricted or interrupted, these side-channel habitats will diminish in productivity and be permanently lost. These habitats cannot be mitigated by the design of a project. They are lost when a channel is fixed in a specific location, regardless of the bank-protection technique.

Activities that involve changing or relocating a stream channel to restore habitat lost because of human-caused changes can result in short term impacts. Channel realignment and bank re-grading typically destroy bank and bed habitat in the active channel and will temporarily lead to elevated suspended sediment concentrations. This may result in the downstream burial of invertebrates, elevated suspended solids, and habitat destruction. In-channel work has a much greater impact on the bank and channel when compared with off-channel work.

Activities that remove, place, and relocate large woody materials in stream channels are conducted where it is necessary to address a threat to life or public or private property, or an immediate threat of serious environmental degradation, caused by streambank erosion or flooding. During construction, these activities can result in short term impacts similar to those described for channel relocation. In general, the disturbed woody material must be replaced in a location within the stream where it could not result in damage, but would continue to help create complex habitats.

Alteration of sediment delivery and movement patterns – Removing sand and gravel from an active channel bed may affect sediment movement if it disrupts the sediment balance in the river. This disruption may cause channel adjustments that extend considerable distances from the excavation site. Outfalls can increase erosion and lead to increased sediment supply to downstream reaches of rivers and streams and trap (accumulate) sediment. Overwater structures also act as groins, which affect longitudinal connectivity and sediment flow. In general, any activity that alters the channel profile by altering the slope or channel width can potentially have an adverse impact on sediment delivery.

Mineral prospecting and mining activities can alter streambed morphology and sediment movement patterns because a variety of machines, including suction dredges, high bankers, and other heavy equipment, are used to remove or sort large quantities of aggregate to separate out valuable minerals. These alterations affect the physical processes that form and maintain fish habitat.

Alteration of hydrologic patterns – Water crossing structures such as bridges or culverts can restrict the flow of streams and rivers and/or affect the movement and distribution of wood and sediment. Activities that involve surface trenching through streambanks and channels for the purpose of installing utility lines may also cause surface and subsurface flows to shift, altering stream hydrology.

Artificial lighting along docks, piers, and marinas may also result in altered predator-prey relationships by concentrating prey species and providing increased opportunities for predators. Artificial lighting may

also result in behavioral effects by interrupting normal light/darkness patterns. For example, nocturnal predators may show avoidance patterns and have reduced foraging success if prey is attracted to the light and the predator is repelled by the light.

Alteration of beaver dams – Beaver dams can be removed, breached, or modified when needed to address a threat to public or private land or infrastructure caused by flooding. Such activities are conducted when the use of water level (flow) control or beaver exclusion devices is not feasible or has not successfully controlled the threat. Breaching, notching, or removing a dam can negatively affect fish, shellfish, and their habitat by de-watering the upstream pond, stranding fish, and releasing sediment and large volumes of water (that can be devoid of oxygen) downstream. Releasing sediment can affect downstream spawning areas. Breaching or removing a beaver dam may not prevent future beaver activity in the area, and persistent breaching or removal can increase the risk of negative impacts to fish habitat.

4.1.1.2 Freshwater impacts that directly harm fish

Constructing or performing work activities in or near watercourses can kill or injure fish or shellfish directly. Impacts associated with hydraulic projects include:

- Direct injury to fish
- Entrainment and stranding
- Elevated underwater sound
- Impacts to water quality

Direct injury to fish - In addition to harming habitat, dredging within freshwater streams or lake shorelines may injure or kill fish and shellfish when dredging equipment traps fish during the uptake of sediments and water.

Mineral prospecting and mining activities can harm fish by physically disturbing eggs or fry incubating within the bed or cause mortality from passing vulnerable fish through mineral prospecting equipment.

Fish can also be harmed during fish salvage efforts (e.g., electrofishing, seining, dip netting) depending upon the method of fish removal and other environmental factors.

Sound waves generated by pile driving or blasting can injure or kill fish.

Entrainment and stranding - Removing sand and gravel from streambeds can create trenches or pits in the bed that can trap fish and lead to death. Surface water diversions are common instream features in agricultural areas where the water is used for irrigation. Throughout the state, people also divert water for other agricultural, hydropower, industrial, recreational, residential, municipal, and hatchery purposes. To protect fish, including salmon and steelhead, Washington State law (RCW 77.57.070 and RCW 77.57.010) requires that all surface water diversions be screened to prevent fish from being drawn into the diversions where they may be injured or killed.

For many projects, isolating in-water work areas within cofferdams or using other methods and then using pumps to remove the remaining water allows construction activities to occur “in the dry.” This technique is fairly common for projects such as bridge and culvert replacements. However, sometimes

fish can be missed during salvage efforts and can be sucked into pump intakes or pumped to upland areas where they die.

Elevated underwater sound – Many hydraulic projects can create excessive underwater noise and vibration in and near the construction site. Highly intensive noise-generating construction activities such as impact pile driving or blasting can negatively affect fish by resulting in direct mortality (impact and vibratory pile driving/blasting), adverse behavioral effects (reduced feeding, impaired predator avoidance), delayed spawning, and delayed migration.

Impacts to water quality - Activities that disturb substrates release suspended sediments into the water column that can affect fish by interfering with breathing and feeding. Vessel activity associated with boat ramps and launches or marinas and terminals can also increase sedimentation and diminish water quality. Using heavy machinery above and below the OHWL of any water body increases the risk of fish exposure to construction-related contaminants such as fuels, oil, grease, or hydraulic fluids, which can be toxic to fish and other aquatic life.

4.1.2 Saltwater Impacts of Hydraulic Projects on Fish

Constructing or performing work activities in or near the saltwater can alter the habitat that fish and shellfish depend on. Direct damage or loss of habitat causes a direct loss of fish and shellfish production. Damaged habitat can continue to cause lost production of fish and shellfish for as long as the habitat remains altered. Work activities can also alter the physical processes that form and maintain fish habitat such as hydrologic patterns and sediment movement. The types of impacts associated with hydraulic projects include:

- Shoreline modification
- Disturbance of substrate
- Alteration of light regime
- Aquatic vegetation modifications
- Direct loss of fish habitat

4.1.2.1 Impacts to saltwater fish habitat

Shoreline modification – Constructing bulkheads, wharves, and piers can result in the removal of marine riparian vegetation, which supplies habitat and structure for the nearshore environment, a source of terrestrial food and nutrients. These structures can also alter sediment delivery to the nearshore, which supports spawning habitat for many species and contributes to the composition and density of aquatic vegetation. These structures can also alter the slope of the marine nearshore; thus altering predator/prey relationships, current patterns, and marine vegetation composition and distribution and ultimately the productivity and composition of fish and other aquatic species in the marine nearshore.

Table 4-1 Common impacts from shoreline modification to beaches and bluffs⁶

Shoreline Modification	Effect
Alteration of erosion or wave energy and changes to supply or distribution of sediments along the shore can result in impacts such as:	<ul style="list-style-type: none"> ○ Loss of backshore due to shoreline armoring ○ Direct loss of beach through downcutting (often caused by shoreline armoring) ○ Indirect loss of beach through armoring of updrift bluffs, the resultant loss of sediment supply followed by changes in beach substrate character and downcutting
Loss of nearshore vegetation:	<ul style="list-style-type: none"> ○ Decreases in terrestrial food supply, shading, and protection from overhead predators due to clearing of marine riparian vegetation ○ Simplification of habitat structure due to removal of large wood and overhanging branches ○ Reduced bluff and beach stabilization, and increased erosion due to vegetation removal
Loss or change to beach substrate	<ul style="list-style-type: none"> ○ Degrades conditions that support aquatic and riparian vegetation ○ Loss of spawning habitat for forage fish

Disturbance of substrate – Most structures constructed in the marine environment require footings or supports, such as steel pipe piles to support piers. Other structures such as boat ramps act as supports for vehicles loading and off-loading boats and other watercraft. These structures can result in disruption of foraging and migration and direct loss of forage fish spawning habitats. For example, a boat launch constructed in the nearshore could displace habitat used by sand lance and surf smelt for spawning resulting in reduced spawning success, lost productivity, and altered predator/prey relationships. Disturbance of substrates can also reduce habitat necessary to support marine vegetation such as eelgrass, which is vital to many marine species including juvenile salmonids and crustaceans. Prop wash from vessels and grounding of floats during low tide can also change substrate structure.

Alteration of fish migration patterns -Juvenile salmon have been shown to avoid moving under an overwater structure if there is an abrupt transition from light to dark. Instead, they react by migrating into deeper water and around the offshore edge of the structure. This migration pathway is in a water depth zone where predators are more likely, travel distances are greater, and currents are stronger. Construction activities that create noise and turbidity can also temporarily disrupt nearshore migration and feeding (EnviroVision 2010).

Alteration of light regime – Similar to the discussion under freshwater impacts, overwater structures such as piers and marinas can alter light transmission into the water and result in reduced growth of aquatic vegetation and destruction of existing aquatic vegetation. Loss of marine vegetation from shading impacts of boats and floats can reduce spawning, rearing, and refugia habitat available to forage fish, and alter predator/prey relationships. In addition, shading from overwater structures alters

⁶ EnviroVision et al. 2010

migration patterns of juvenile salmon, leading them away from the intertidal zone and into deeper waters along the shoreline, elevating the risk of predation for many species.

Aquatic vegetation modifications – Human activities and shoreline modification can adversely affect seagrass and kelp and other aquatic vegetation through direct removal or degradation and indirectly through altering the environmental conditions that support them. Overwater structures, shoreline armoring, riparian vegetation alteration, boating, illegal harvesting, shellfish culturing, and water quality impairments all have the potential to affect the health of aquatic vegetation. These activities can alter light and nutrient levels, alter substrate composition, increase toxics and suspended sediments, or physically disturb aquatic vegetation (EnviroVision et al. 2010).

Direct loss of fish habitat – Structures that displace natural habitat with something that is man-made can be considered a direct loss of fish habitat. Similar to the discussion under freshwater, these structures include piers, floats, buoys, boat ramps. Many of these structures require installing piles or concrete forms that displace natural habitats. This can result in lost productivity at all levels of the food chain, altered predator/prey relationships, increased competition for resources, altered migration patterns, and altered physical processes.

4.1.2.2 Saltwater impacts that directly harm fish

Constructing or performing work activities in or near watercourses can kill or injure fish or shellfish directly. Impacts associated with hydraulic projects include:

- Entrainment
- Noise and vibration
- Water quality/sediment

Entrainment –In the marine environment, entrainment is most likely to occur during dredging activities. During dredging, fish, shellfish, and other aquatic invertebrates can be injured or killed if trapped within the dredging device.

Noise and vibration –Noise and vibration impacts to saltwater species would be the same as those described for freshwater species.

Water quality/sediment – Construction of facilities along or within the marine nearshore presents many challenges to fish and other aquatic organisms. Facilities such as marinas and terminals constructed along or within the marine nearshore have high levels of human traffic and a capacity to hold and store large numbers of watercraft. Potential harm or injury to fish is related to the accidental discharge of contaminants such as fuel, oil, and sewage. In industrial settings, piers, wharves and other facilities can support more high-intensity construction and related activities such as ship building and maintenance. These activities have even higher potential for introducing contaminants into the water.

4.1.3 Impacts of Hydraulic Code Rules Alternatives on Fish

Table 4-4 summarizes how proposed changes to the Hydraulic Code Rules affect fish, what impacts are caused by hydraulic projects, and compares how the proposed changes affect impacts of the hydraulic projects. Column 1 shows the hydraulic project type and Column 2 lists the potential impacts of the hydraulic project that could affect fish based on the impacts described in this section. The third, fourth,

and fifth columns list the provisions of Alternatives 2, 3, and 4 that address the potential impacts in the second column. Alternative 1 - No Action does not appear as a column in Table 4-4 because there are no changes proposed. The columns includes a brief assessment of whether the proposed rule changes under each of the alternatives will reduce, maintain, or increase the risk to impacts compared to the existing rules (Alternative 1 - No Action Alternative). Provisions of Alternatives 3 and 4 that would require statutory change are not evaluated on this table. None of the Alternative 2 proposed rule changes are expected to degrade conditions for fish.

Table 4-2 compares the impacts of the alternatives on the Fish element by summarizing the level of risk of that alternative impacting the named element – in this case, risk of impacts to fish. Reduction or increase in risk is evaluated in the context with the no-action alternative (Alternative 1).

Table 4-2 Comparison of Impacts of the Alternatives to the Fish Element

Element Impacted	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Fish	No change in risk	Significant reduction in risk	Further reduction in risk	Increased risk

4.1.1 Mitigation

Alternative 2 and 3 proposed rule revisions provide a higher level of protection for fish and other aquatic species and their habitats than the existing rules. Implementing programmatic Alternatives 2 or 3 would be self-mitigating with respect to impacts to the natural environment, meaning that no additional mitigation is needed to offset potential significant adverse environmental impacts of adopting these proposed rule changes. These two alternatives differ, however, in their impacts to the built environment.

Alternative 4 proposed rule revisions represent changes in risk of impacts to the natural environment when compared with either Alternative 1 or Alternatives 2 and 3.

Individual hydraulic projects may still require mitigation.

4.2 Earth

Impacts to earth from hydraulic projects are primarily limited to disturbance at the immediate project location. As discussed in section 4.1, those impacts include increased potential for erosion, deposition, and sedimentation; disturbance to substrate and banks; and changes to contour/topography.

4.2.1 Impacts of Hydraulic Projects on Sedimentation, Erosion, and Topography

Filling, grading, and freshwater channel modifications

Changes to channel geometry include channel straightening and shortening, channel narrowing, reduced habitat complexity, channel incision, channel braiding, decreased channel migration and side channel creation, and decreased floodplain connectivity.

Changes to substrate include increased scour, increased deposition, substrate coarsening, reduced large woody debris and organic material recruitment, and reduced gravel recruitment and transport.

Project types most likely to result in these impacts include water crossings (culverts, bridges), fish passage, flow control structures, bank protection, channel modifications, habitat modifications, shoreline modifications, overwater structures (docks, floats), and marinas and marine terminals. Vessel grounding, anchoring, and prop wash (related to project construction or operation of a boat launch for example) can also impact substrate composition and geometry. Any project involving grading or filling could cause these impacts.

Saltwater modifications

Changes to marine nearshore “earth” processes and geometry related to hydraulic projects include altered sediment supply, transport, littoral drift, and altered substrate composition. Hydraulic project types primarily responsible for these impacts include flow control structures, bank protection, shoreline modifications, channel modifications, habitat modifications, and overwater structures such as docks, floats, marinas, and marine terminals.

Dredging

Dredging changes bathymetry and substrate composition; alters water circulation and subsequent nutrient, prey, and habitat availability; and re-suspends contaminants. Dredging is often required for water crossings, fish passage structures, flow control structures, bank protection and shoreline modification projects, overwater structures, and for channel modification.

Mineral prospecting

None of the three alternatives propose substantive changes to mineral prospecting rules.

Table 4-3 Comparison of Impacts of the Alternatives to the Earth Element

Element Impacted	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Substrate size	No change in risk	Reduction in risk	Further reduction in risk	Increased risk
Topography	No change in risk	Reduction in risk	Further reduction in risk	Increased risk

4.2.2 Mitigation for impacts to earth

The general construction requirements for hydraulic projects include provisions to minimize disturbance from construction by minimizing the size of the construction area, installing erosion protection, protecting disturbed areas from further erosion, and replacing vegetation following construction. Design standards for hydraulic projects such as boat ramps and docks also minimize impacts on earth.

Table 4-4 Regulated Project Activities, Potential Impacts, and Provisions of the Alternatives

Regulated Hydraulic Projects Activity (WAC)	Potential Impacts to Fish Caused by Hydraulic Projects	Comparison of Alternative 2 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 3 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 4 Fish Impacts to Alternative 1 – No Action
<p>Purpose E 220-110-010 P 220-660-010</p>	<i>Not Applicable</i>	No change to risk of impacts	No alternative	Increases risk of impacts <i>The Commission would restrict how the department could use our authority to projects conducted waterward of OHWL. This would increase the risk to fish life from bank protection, bridge, levee and dike and other projects conducted landward of the OHWL.</i>
<p>Instructions for using chapter E New section P 220-660-020</p>	<i>Not Applicable</i>	No change to risk of impacts	No alternative	No alternative
<p>Definitions E 220-110-020 P 220-660-030</p>	<i>Not Applicable</i>	Reduces the risk of impacts <i>The new and amended definitions clarify the intent of the terms as they relate to the rules. Improved understanding of the terms may lead to improved compliance with the rules.</i>	No alternatives	No change to risk of impacts <i>Retaining the current definitions of “freshwater area”, “saltwater area” and “watercourse” and removing new definitions for “fish habitat” and “unimpeded fish passage” would not change the risk. It would just reduce clarity about how the rules are applied.</i>
<p>Applicability of hydraulic project approval authority E 220-110-035 P 220-660-040</p>	<i>Not Applicable</i>	No change to risk of impacts <i>Minimal changes are proposed to the existing rules.</i>	No alternative	No alternative
<p>Procedures E 220-110-030 E 220-110-031 P 220-660-050</p>	<i>Not Applicable</i>	No change to risk of impacts <i>The time saved on processing applications for the low-risk project types authorized in general HPAs and “model HPAs” is spent on higher risk projects. Other changes to the procedures implement changes to the statute.</i>	<p>Reduced risk of impacts <i>WDFW would issue standard HPAs for the ~2000 projects authorized each year in general HPAs. The reduced risk assumes an increase in staffing to process the 2,000 additional applications.</i></p> <p>Increases risk of impacts <i>If there is no increase in staffing, WDFW would have to use more staff resources to process low risk applications reducing the amount of time spent on medium and high risk projects.</i></p>	No change to risk of impacts <i>The limit on the number of sites that can be covered in a multi-site HPA would be removed. The number would be determined by each individual biologist based on work load.</i>
<p>Integration of hydraulic projects approvals and forest practices applications E 220-110-085 P 220-660-060</p>	<i>Not Applicable</i>	No change to risk of impacts <i>No change is proposed to the existing rules.</i>	No Alternative	No change to risk of impacts <i>Repeating the rules applicable to forest practices would not change the risk to fish life.</i>
<p>Changes to hydraulic project approval technical provisions E 220-110-032 P 220-660-070</p>	<i>Not Applicable</i>	No change to risk of impacts <i>Minimal changes are proposed to the existing rules.</i>	No alternative	Increases risk of impacts <i>This clause “loss of or injury to fish or shellfish, or the loss or permanent degradation of the habitat that supports the fish and shellfish populations” would be replaced by “will be protective of fish life.” This change would be less protective than the existing language 220-110-032(4).</i>

Regulated Hydraulic Projects Activity (WAC)	Potential Impacts to Fish Caused by Hydraulic Projects	Comparison of Alternative 2 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 3 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 4 Fish Impacts to Alternative 1 – No Action
<p>Mitigation requirements for hydraulic projects E New Section P 220-660-080</p>	<p><i>Not Applicable</i></p>	<p>No change to risk of impacts. <i>The new WAC section clarifies how the department determines mitigation requirements to protect fish life. "Protection of fish life" means avoiding and minimizing impacts to fish life and fish habitat through mitigation sequencing.</i></p>	<p>Reduces risk of impacts <i>Requiring compensatory mitigation for the following would reduce the risk of impacts to habitat:</i></p> <ul style="list-style-type: none"> • <i>Maintaining or repairing a structure that currently diminishes habitat and/or perpetuates impacts into the future; and</i> • <i>Rehabilitation or replacement of structurally deficient or functionally obsolete structures that is required for new structures.</i> 	<p>Increases risk of impacts <i>Not requiring "compensatory mitigation for all work that causes a new impact or compensation for temporal loss, uncertainty of performance, and differences in habitat functions, type, and value" will increase the risk of impacts. This doesn't conform with the mitigation policy dated 01/08/99.</i></p>
<p>Technical Provisions E 220-110-040 E 220-110-230 P 220-660-090</p>	<p><i>Not Applicable</i></p>	<p>No change to risk of impacts</p>	<p>No alternative</p>	<p>No alternative</p>
<p>Freshwater habitats of special concern E New section P 220-660-100</p>	<p><i>Not Applicable</i></p>	<p>Reduces risk of impacts <i>New WAC section identifies habitats that serve essential functions for twenty-two freshwater fish species. The presence of these habitats may restrict hydraulic project type, design, location, and timing.</i></p>	<p>No alternative</p>	<p>No alternative</p>
<p>Authorized work times in freshwater areas E New section P 220-660-110</p>	<p><i>Not Applicable</i></p>	<p>Reduces risk of impacts <i>New WAC section describes the criteria the department will to authorize work to protect fish life during critical life stages.</i></p>	<p>Reduces risk of impacts <i>The work times in the table "Times when spawning or incubating salmonids are least likely to be within Washington State freshwaters" would apply to all in-water projects regardless of the risk to fish life from the work.</i></p>	<p>No alternative</p>
<p>Common freshwater construction provisions E New section P 220-660-120</p>	<ul style="list-style-type: none"> – <i>Aquatic vegetation modifications</i> – <i>Disturbance of streambank or lake shoreline</i> – <i>Direct loss of habitat</i> – <i>Riparian vegetation modifications</i> – <i>Entrainment, stranding and handling impacts to fish</i> – <i>Water quality modifications</i> 	<p>Reduces risk of impacts <i>New WAC section has additional construction provisions for job site access, equipment use, sediment and erosion control reduce impacts to sensitive areas and water quality. New provisions for construction materials and work area isolation reduce impacts to water quality. The new work area isolation and fish removal provisions also protect fish from entrainment, stranding and handling.</i></p>	<p>Reduces risk of impacts <i>The use of all treated wood and tires would be prohibited. This would reduce risk of water quality modifications.</i></p>	<p>No change to risk of impacts <i>The work area isolation and fish removal provisions would not be included into the new rules. The existing provisions in the current rules would be retained.</i></p>

Regulated Hydraulic Projects Activity (WAC)	Potential Impacts to Fish Caused by Hydraulic Projects	Comparison of Alternative 2 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 3 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 4 Fish Impacts to Alternative 1 – No Action
<p>Streambank protection and lake shoreline stabilization E 220-110-050 E 220-110-223 P 220-660-130</p>	<ul style="list-style-type: none"> – Aquatic vegetation modification – Alteration of fish migration patterns – Disturbance of streambank and lake shoreline – Direct loss of habitat – Disturbance of riparian vegetation – Disturbance of substrate – Alteration of stream morphology – Alteration of sediment delivery and movement patterns – Water quality modifications 	<p>Reduces risk of impacts A new provision would require a professional’s rationale to ensure new bank protection is designed with a less impacting technically feasible alternative.</p> <p>New provisions require designs to consider the ecological and geomorphological processes. This reduces alteration of the stream morphology, sediment delivery and movement and disturbance of the substrate.</p> <p>New provisions restrict location of replacement structures once a new ordinary high water line has reestablished. This reduces alteration of the stream morphology.</p>	<p>Reduces the risk of impacts A new provision would always require a professional’s rationale to ensure new bank protection is designed with a less impacting technically feasible alternative. This would provide a professional third party opinion to help the department determine if the least impacting option is being proposed by the applicant.</p> <p>The design and location of new and replacement structures would have to consider climate change. This would reduce the risk of future alteration of the stream morphology, sediment delivery and movement and disturbance of the substrate.</p>	<p>No change to risk of impacts A new provision to require a professional’s rationale would not be included in the new rules. This is not in the current rules. The existing rules rely on the judgment of the department.</p>
<p>Residential and public recreational docks, piers, ramps, floats, watercraft lifts, and buoys in freshwater areas E 220-110-060 P 220-660-140</p>	<ul style="list-style-type: none"> – Alteration of light regime – Aquatic vegetation modifications – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Direct loss of habitat – Riparian vegetation modifications – Disturbance of substrate – Elevated underwater sound impacts to fish – Water quality modifications 	<p>Reduces risk of impacts New provisions require designs to avoid and minimize impacts to freshwater habitats of special concern. This reduces the risk of impacts from alteration of the light regime, aquatic vegetation modifications, alteration of migration patterns, and disturbance of substrate.</p> <p>New pile driving provisions reduce the risk of impacts from elevated sound.</p> <p>New provisions for the removal of treated wood piling reduce risk from water quality modification.</p>	<p>Reduces risk of impacts New provisions for grating would be changed to require grating to cover 100% of the deck regardless of the orientation, width and height of the structure. This will reduce the risk of impacts from alteration of the light regime, aquatic vegetation modifications, and alteration of migration patterns.</p>	<p>No change to risk of impacts The provisions for grating and those specifying pier height and width would be removed. These are not in the current rules.</p>
<p>Boat ramps and launches in freshwater areas E 220-110-224 P 220-660-150</p>	<ul style="list-style-type: none"> – Alteration of light regime – Aquatic vegetation modifications – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Direct loss of habitat – Riparian vegetation modifications – Disturbance of substrate – Alteration to stream morphology – Alteration to sediment delivery and movement patterns 	<p>Reduces risk of impacts New provision requires locating ramps and launches to avoid direct loss of spawning habitat.</p> <p>New design provisions reduce the risk of alteration of light regime, migration patterns, stream morphology and sediment delivery and movement.</p>	<p>No alternative</p>	<p>No alternative</p>

Regulated Hydraulic Projects Activity (WAC)	Potential Impacts to Fish Caused by Hydraulic Projects	Comparison of Alternative 2 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 3 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 4 Fish Impacts to Alternative 1 – No Action
<p>Marinas and terminals in freshwater areas E New section P 220-660-160</p>	<ul style="list-style-type: none"> – Alteration of light regime – Aquatic vegetation modifications – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Direct loss of habitat – Riparian vegetation modifications – Disturbance of substrate – Elevated underwater sound – Water quality modifications 	<p>Reduces risk of impacts <i>This new WAC section requires designs to avoid impacts to fish spawning areas and juvenile salmon migration corridors, rearing and feeding areas. This reduces risk of alteration of the light regime and migration patterns.</i></p> <p><i>A provision requires new facilities to avoid and minimize impacts to aquatic vegetation.</i></p> <p><i>Several provisions require the location of facilities in areas that will reduce impacts to fish life, where possible. This reduces the risk of impacts from aquatic vegetation modifications, alteration of migration patterns, disturbance of substrate, and alteration of stream morphology and sediment movement and delivery.</i></p> <p><i>Pile driving provisions reduce the risk of impacts from elevated sound.</i></p> <p><i>New provisions for the removal of treated wood piling reduce risk from water quality modification.</i></p>	<p>No alternative</p>	<p>No increased risk of impacts <i>Provisions would be added for bulkheads and other bank stabilization in the marina/marine terminal environment instead of referring applicants to proposed WAC section 220-660-130. This would result in duplicate language.</i></p>
<p>Dredging in freshwater areas E 220-110-130 P 220-660-170</p>	<ul style="list-style-type: none"> – Alteration of light regime – Aquatic vegetation modifications – Alteration of fish migration patterns – Direct loss of habitat – Disturbance of substrate – Alteration to stream morphology – Alteration to sediment delivery and movement patterns – Entrainment, stranding and handling impacts to fish – Water quality modifications 	<p>Reduces risk of impacts <i>A new provision requires a professional to conduct a pre-project channel survey to determine the potential channel changes from the project. This will reduce the risk of alteration to the stream morphology and sediment delivery and movement.</i></p>	<p>Reduces risk of impacts <i>The existing rules do not have a section for removing gravel and debris from small streams so including this section will result in reduced risk. Currently each biologist provisions HPAs for this work based on their professional judgment since there are no common provisions in rule.</i></p> <p><i>Adding a provision to require scientific justification to prove that dredging will resolve flooding problems would provide a professional third party opinion to help the department determine if dredging is a proper solution given the impacts.</i></p>	<p>No change to risk of impacts <i>A new provision to require a survey would not be included in the new rules.</i></p>
<p>Sand and gravel removal E 220-110-140 P 220-660-180</p>	<ul style="list-style-type: none"> – Alteration of light regime – Aquatic vegetation modifications – Alteration of fish migration patterns – Direct loss of habitat – Disturbance of substrate – Alteration to stream morphology – Alteration to sediment delivery and movement patterns – Entrainment, stranding and handling impacts to fish – Water quality modifications 	<p>No change to risk of impacts</p>	<p>No alternative</p>	<p>No alternative</p>

Regulated Hydraulic Projects Activity (WAC)	Potential Impacts to Fish Caused by Hydraulic Projects	Comparison of Alternative 2 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 3 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 4 Fish Impacts to Alternative 1 – No Action
<p>Water crossing structures E 220-110-070 P 220-660-190</p>	<ul style="list-style-type: none"> – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Direct loss of habitat – Riparian vegetation modifications – Disturbance of substrate – Alteration to stream morphology – Alteration to sediment delivery and movement – Alteration to hydrologic patterns 	<p>Reduces risk of impacts The WAC section is amended. Currently, water crossing designs must provide fish passage. The amended language requires water crossing designs to also protect the stream morphology, sediment delivery and movement, movement of wood and hydrologic patterns and prevent substrate disturbance.</p>	<p>Reduces risk of impacts Moving the no-slope culvert option to Section 200 and requiring only stream simulation culverts unless the permittee can show that stream simulation is not feasible, will reduce risk of impacts to fish habitat. The stream-simulation method is shown to protect the stream morphology, sediment delivery and movement, movement of wood and hydrologic patterns and prevent substrate disturbance.</p>	<p>No change to risk of impacts Even if the culvert design standards are removed, the applicant would have to show the proposed design would meet fish protection standards. In the absence of rules this would be entirely up the judgment of biologist or WDFW engineer to determine.</p> <p>Retaining the existing bridge provisions would not increase the risk of impacts.</p> <p>Increases risk of impacts Adding guidelines by name to the rules that are outside the control of the department would increase the risk of impacts if the guidelines changed and reduced fish protection.</p> <p>Amending the rules to use a channel forming flow, such as the 2-year flood, will increase the risk of impacts. The existing rules state “The bridge shall be constructed, according to the approved design, to pass the 100-year peak flow with consideration of debris likely to be encountered...”</p>
<p>Fish passage improvement structures E New section P 220-660-200</p>	<ul style="list-style-type: none"> – Alteration of light regime – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Direct loss of habitat – Disturbance of substrate – Alteration to stream morphology – Alteration to sediment delivery and movement patterns – Alteration to hydrologic patterns – Entrainment, stranding and handling of fish 	<p>Reduces impacts to fish life This new WAC section includes provisions to ensure fish passage improvement structures (fish ladders, fish passage weirs, roughened channels, trap and haul operations and hydraulic design culverts) provide fish passage. This would reduce the risk of impacts to fish migration patterns and from the entrainment, stranding and handling of fish.</p>	<p>Reduces impacts to fish life The new WAC section would require all fish passage improvement structures be installed temporarily. The section would include timeframes for barrier correction. This would reduce the risk of impacts to fish migration patterns, alteration of stream morphology, sediment delivery and movement, and hydraulic patterns. This would also reduce the risk of impacts from entrainment, stranding and handling of fish.</p>	<p>No change to risk of impacts The new WAC section would not require fish ladders to have enough water to pass fish safely if target fish species are present and actively migrating. Since this provision is not in the rules now, removing it would not change the risk of impacts. The bridge shall be constructed, according to the approved design, to pass the 100-year peak flow with consideration of debris likely to be encountered. Exception shall be granted if applicant provides hydrologic or other information that supports alternative design criteria.</p>
<p>Channel change/ realignment E 220-110-080 P 220-660-210</p>	<ul style="list-style-type: none"> – Aquatic vegetation modifications – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Direct loss of habitat – Riparian vegetation modifications – Disturbance of substrate – Alteration to stream morphology – Alteration to sediment delivery and movement patterns – Alteration to hydrologic patterns 	<p>Reduces risk of impacts A new provision clarifies a channel change must provide better protection of fish life than the old channel. This would reduce the risk of direct loss of habitat.</p>	<p>No alternatives</p>	<p>No Alternatives</p>

Regulated Hydraulic Projects Activity (WAC)	Potential Impacts to Fish Caused by Hydraulic Projects	Comparison of Alternative 2 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 3 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 4 Fish Impacts to Alternative 1 – No Action
<p>Large woody material placement, repositioning and removal in freshwater areas E 220-110-150 P 220-660-220</p>	<ul style="list-style-type: none"> – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Direct loss of habitat – Disturbance of substrate – Alteration to stream morphology – Alteration to sediment delivery and movement patterns – Alteration to hydrologic patterns 	<p>No change to risk of impacts The department will still approve the repositioning or removal of large woody material within the watercourse when needed to protect life, the public, property, or when needed to construct or mitigate for a hydraulic project. Compensatory mitigation will be required if the removal of wood from the channel diminishes fish habitat function or value.</p>	<p>No alternative</p>	<p>No alternative</p>
<p>Beaver dam management E New section P 220-660-230</p>	<ul style="list-style-type: none"> – Aquatic vegetation modifications – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Direct loss of habitat – Disturbance of substrate – Alteration to stream morphology – Alteration to sediment delivery and movement patterns – Alteration to hydrologic patterns – Alteration of beaver dams – Entrainment, stranding and handling of fish – Water quality modifications 	<p>Reduces risk of impacts New WAC section allows the removal, breaching, or modification of dams and the design and construction of beaver deceivers and pond water level control devices only when it is needed to protect property and infrastructure. This reduces the risk from potential impacts.</p>	<p>Reduces risk of impacts A new provision would be added that would require an applicant to obtain professional determination that shows there is an imminent threat to property or the environment.</p>	<p>No alternative</p>
<p>Pond construction E 220-110-180 P 220-660-240</p>	<ul style="list-style-type: none"> – Disturbance of streambank or lake shoreline – Direct loss of habitat – Disturbance of substrate – Alteration to stream morphology – Alteration to sediment delivery and movement patterns – Alteration to hydrologic patterns – Entrainment, stranding and handling of fish – Water quality modifications 	<p>No change to risk of impacts The provision to require a water right is removed. This would not change the risk of impacts because it is the responsibility of Department of Ecology to enforce water rights.</p>	<p>No change to risk of impacts The provision to require a water right is retained. This would not change the risk of impacts because it is the responsibility of Department of Ecology to enforce water rights.</p>	<p>No alternative</p>
<p>Water diversions and intakes E 220-110-190 P 220-660-250</p>	<ul style="list-style-type: none"> – Disturbance of streambank or lake shoreline – Disturbance of substrate – Alteration to hydrologic patterns – Entrainment, stranding and handling of fish 	<p>No change to risk of impacts The provision to require a water right is removed. This would not change the risk of impacts because it is the responsibility of Department of Ecology to enforce water rights.</p>	<p>No change to risk of impacts The provision to require a water right is retained. This would not change the risk of impacts because it is the responsibility of Department of Ecology to enforce water rights.</p>	<p>No alternative</p>
<p>Outfall structures in freshwater areas E 220-110-170 P 220-660-260</p>	<ul style="list-style-type: none"> – Aquatic vegetation modifications – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Direct loss of habitat – Disturbance of substrate – Alteration to stream morphology – Alteration to sediment delivery and movement patterns – Alteration to hydrologic patterns – Entrainment, stranding and handling of fish – Water quality modifications 	<p>No change to risk of impacts No provisions are added to reflect statutory changes to the department’s authority to regulate stormwater.</p>	<p>No alternative</p>	<p>No alternative</p>

Regulated Hydraulic Projects Activity (WAC)	Potential Impacts to Fish Caused by Hydraulic Projects	Comparison of Alternative 2 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 3 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 4 Fish Impacts to Alternative 1 – No Action
<p>Utility crossings in freshwater areas E 220-110-100 P 220-660-270</p>	<ul style="list-style-type: none"> – Aquatic vegetation modifications – Disturbance of streambank or lake shoreline – Disturbance of substrate – Alteration to sediment delivery and movement patterns 	<p>Retains current rules except language is added for utility line design and directional drilling</p>	<p>Add provision</p> <ul style="list-style-type: none"> • The department would require that conduit lines in watercourses would not constrict the channel or preclude future opportunities for bridges or other less-impacting approaches to water crossings. 	<p>No alternatives</p>
<p>Felling and yarding of timber E 220-110-160 P 220-660-280</p>	<ul style="list-style-type: none"> – Aquatic vegetation modifications – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Direct loss of habitat – Disturbance of substrate – Alteration to stream morphology – Alteration to sediment delivery and movement – Alteration to hydrologic patterns – Alteration of beaver dams – Entrainment, stranding and handling of fish – Water quality modifications 	<p>No change to risk of impacts <i>Retains the current rule provisions.</i></p>	<p>No alternatives</p>	<p>No alternatives</p>
<p>Aquatic plant removal and control E 220-110-331 E220-110-332 E 220-110-333 E 220-110-334 E 220-110-335 E 220-110-336 E 220-110-337 E 220-110-338 P 220-660-290</p>	<ul style="list-style-type: none"> – Aquatic vegetation modifications – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Direct loss of habitat – Disturbance of substrate – Entrainment, stranding and handling of fish – Water quality modifications 	<p>No change to risk of impacts <i>Retains the current rule provisions.</i></p>	<p>No alternatives</p>	<p>No alternatives</p>
<p>Mineral prospecting E 220-110-200 E 220-110-201 E 220-110-202 E 220-110-206 P 220-660-300</p>	<ul style="list-style-type: none"> – Aquatic vegetation modifications – Alteration of fish migration patterns – Disturbance of streambank or lake shoreline – Disturbance of substrate – Entrainment, stranding and handling of fish – Water quality modifications 	<p>Reduces risk of impacts <i>The changes to the work windows reduce the risk of impacts to spawning and incubating fish</i></p> <p>No change to risk of impacts <i>The additional rules for small-scale mineral prospecting on ocean beaches will not affect the risk of impacts because the rules reflect the HPA provisions the department currently uses.</i></p>	<p>Reduces risk of impacts <i>Additional timing restrictions supported by survey information or other science would reduce the risk of impacts.</i></p>	<p>Increases risk of impacts <i>The reversion of the work windows back to the 1994 windows would increase the risk to fish life.</i></p>
<p>Tidal reference areas E 220-110-240 P 220-660-310</p>	<p><i>Not applicable</i></p>	<p>No change to risk of impacts <i>Retains the current rule provisions.</i></p>	<p>No alternatives</p>	<p>No alternatives</p>

Regulated Hydraulic Projects Activity (WAC)	Potential Impacts to Fish Caused by Hydraulic Projects	Comparison of Alternative 2 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 3 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 4 Fish Impacts to Alternative 1 – No Action
<p>Saltwater habitats of special concern E 220-110-250 P 220-660-320</p>	<p><i>Not applicable</i></p>	<p>Reduces risk of impacts <i>The addition of Olympia oyster and nearshore processes to the section will reduce risk of impacts from shoreline modifications.</i> No change to risk of impacts <i>Removing rock sole spawning beds will have no effect on risk because science gathered after 1994 show they are not obligate beach spawning fish.</i></p>	<p>No change to risk of impacts <i>Retaining rock sole spawning beds will have no effect on risk because science gathered after 1994 show they are not obligate beach spawning fish.</i></p>	<p>Increases risk of impacts <i>Removing the phrase “adjacent areas” will increase the risk because this language is in the existing rules. WAC 220-110-250 states “In the following saltwater habitats of special concern, or areas in close proximity with similar bed materials, specific restrictions regarding project type, design, location, and timing may apply...”.</i></p>
<p>Authorized work times in saltwater areas E 220-110-271 P 220-660-330</p>	<p><i>Not applicable</i></p>	<p>Reduces risk of impacts <i>Reducing the work times by two months will reduce risk to juvenile salmon. Adding work times to protect herring spawning beds in two new areas and adding work times to protect lingcod nursery and settlement areas will also reduce the risk of impacts from shoreline modifications.</i> No change to risk of impacts <i>Removing the work time to protect rock sole spawning beds will have no effect on risk because science gathered after 1994 show they are not obligate beach spawning fish.</i></p>	<p>Reduces risk of impacts <i>Applying work times to suspected as well as known habitat will reduce the risk to saltwater habitats of special concern that have not been mapped by the department. Applying work times regardless of the risk to the saltwater habitats of special concern will reduce the risk from unknown or unforeseen impacts.</i> No change to risk of impacts <i>Retaining the work time to protect rock sole spawning beds will have no effect on risk because science gathered after 1994 show they are not obligate beach spawning fish.</i></p>	<p>No change to risk of impacts <i>The existing work times would be retained.</i></p>
<p>Intertidal forage fish spawning habitat surveys E New section P 220-660-340</p>	<p><i>Not applicable</i></p>	<p>No change to risk of impacts <i>The existing rules give permittees the option of doing surveys in project locations where spawning occurs for six months or longer. The new section just codifies the method.</i></p>	<p>No alternative</p>	<p>No alternative</p>
<p>Seagrass and macroalgae habitat surveys E New section P 220-660-350</p>	<p><i>Not applicable</i></p>	<p>Reduces risk of impacts <i>New WAC section clarifies when an eelgrass/macroalgae habitat survey is required. This reduces the risk to aquatic vegetation.</i></p>	<p>No alternative</p>	<p>No alternative</p>
<p>Common construction provisions for saltwater areas E 220-660-270 P 220-110-360</p>	<ul style="list-style-type: none"> – Direct loss of habitat – Shoreline modification – Aquatic vegetation modifications – Disturbance of substrate – Water quality modifications 	<p>Reduces risk of impacts <i>New provisions added for equipment use, vessel operation, sediment and erosion control reduces impacts to sensitive areas and water quality. New provisions for construction materials reduce impacts to water quality.</i></p>	<p>Reduces risk of impacts <i>The use of all treated wood and tires would be prohibited. This would reduce risk of water quality modifications.</i></p>	<p>No alternative</p>
<p>Bulkheads and other bank protection in saltwater areas E 220-110-280 P 220-660-370</p>	<ul style="list-style-type: none"> – Direct loss of habitat – Shoreline modification – Alteration of fish migration patterns – Aquatic vegetation modifications – Disturbance of substrate 	<p>Reduces risk of impacts <i>New provisions added for re-establishment landward of a breached bulkhead, a preference for the least impacting alternative, and a site assessment, alternatives analysis, and design rationale by a qualified professional reduce impacts from shoreline modifications.</i></p>	<p>Impact not evaluated <i>Requiring single-family residence bulkheads (RCW 77.55.141) to provide a site assessment, alternatives analysis, and design rationale by a qualified professional to show the least impacting feasible alternative bank protection method as proposed would reduce impacts from shoreline modifications. [would require statutory change]</i></p>	<p>No alternatives</p>

Regulated Hydraulic Projects Activity (WAC)	Potential Impacts to Fish Caused by Hydraulic Projects	Comparison of Alternative 2 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 3 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 4 Fish Impacts to Alternative 1 – No Action
<p>Residential and public recreational docks, piers, ramps, floats watercraft lifts, and buoys in saltwater areas E 220-110-300 P 220-660-380</p>	<ul style="list-style-type: none"> – Direct loss of habitat – Shoreline modification – Alteration of light regime – Alteration of fish migration patterns – Aquatic vegetation modifications – Disturbance of substrate – Elevated underwater sound – Water quality modifications 	<p>Reduces the risk of impacts New provisions require designs to avoid and minimize impacts to saltwater habitats of special concern. This reduces the risk of impacts from alteration of the light regime, aquatic vegetation modifications, alteration of migration patterns, and disturbance of substrate.</p> <p>New pile driving provisions reduce the risk of impacts from elevated sound.</p> <p>New provisions for the removal of treated wood piling reduce risk from water quality modification.</p>	<p>Reduces risk of impacts New provisions for grating would be changed to require grating to cover 100% of the deck regardless of the orientation, width and height of the structure. This will reduce the risk of impacts from alteration of the light regime, aquatic vegetation modifications, and alteration of migration patterns</p>	<p>No alternatives</p>
<p>Boat ramps and launches in saltwater areas E New section P 220-660-390</p>	<ul style="list-style-type: none"> – Direct loss of habitat – Shoreline modification – Alteration of light regime – Alteration of fish migration patterns – Aquatic vegetation modifications – Disturbance of substrate 	<p>Reduces the risk of impacts New WAC section lists design alternatives from the most preferred to the least. New section reduces direct loss of habitat, shoreline modification, aquatic vegetation modification and disturbance to substrate.</p>	<p>No alternatives</p>	<p>No change to risk of impacts Deleting proposed provisions would not change the risk of impact since this is a new section.</p>
<p>Marinas and terminals in saltwater areas E 220-110-330 P 220-660-400</p>	<ul style="list-style-type: none"> – Direct loss of habitat – Shoreline modification – Alteration of light regime – Alteration of fish migration patterns – Aquatic vegetation modifications – Disturbance of substrate – Elevated underwater sound – Water quality modifications 	<p>Reduces risk of impacts This section is amended to include terminals.</p> <p>Several provisions require the location of facilities in areas that will reduce impacts to fish life, where possible. This reduces the risk of impacts from shoreline modification, alteration of light regimes, aquatic vegetation modifications, alteration of migration patterns, and disturbance of substrate.</p> <p>Pile driving provisions reduce the risk of impacts from elevated sound.</p> <p>New provisions for the removal of treated wood piling reduce risk from water quality modification.</p>	<p>Reduces risk of impact Adding a provision that requires new and expanded docks, wharves, piers, marinas, rafts, shipyards and terminals to a specified buffer distance from existing native aquatic vegetation attached to or rooted in substrate would reduce risk from aquatic vegetation modifications.</p>	<p>No increased risk of impacts Provisions would be added for bulkheads and other bank stabilization in the marina/marine terminal environment instead of referring applicants proposed WAC section 220-660-370. This would result in duplicate language.</p>
<p>Dredging in saltwater areas E 220-110-320 P 220-660-410</p>	<ul style="list-style-type: none"> – Direct loss of habitat – Alteration of light regime – Alteration of fish migration patterns – Aquatic vegetation modifications – Disturbance of substrate – Entrainment, stranding and handling of fish – Water quality modifications 	<p>Reduces risk of impacts New provision that requires hydrodynamic modeling will reduce risk from water quality modification.</p> <p>New provisions that require dredging to avoid converting intertidal to subtidal habitat reduce risk from direct loss of habitat.</p>	<p>No alternative</p>	<p>No alternative</p>

Regulated Hydraulic Projects Activity (WAC)	Potential Impacts to Fish Caused by Hydraulic Projects	Comparison of Alternative 2 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 3 Fish Impacts to Alternative 1 – No Action	Comparison of Alternative 4 Fish Impacts to Alternative 1 – No Action
Artificial aquatic habitat structures E New section P 220-660-420	<ul style="list-style-type: none"> – Aquatic vegetation modifications – Disturbance of substrate 	Reduces risk of impacts New WAC section specifies structures must provide a net benefit to fish.	No alternatives	No alternatives
Outfall, tide and flood gate structures in saltwater areas E New section P 220-660-430	<ul style="list-style-type: none"> – Direct loss of habitat – Shoreline modification – Aquatic vegetation modifications – Disturbance of substrate – Entrainment, stranding and handling of fish – Water quality modifications 	No change to risk of impacts No provisions are added to reflect statutory changes to the department’s authority to regulate stormwater.	No alternatives	No alternatives
Utility lines in saltwater areas E 220-110-310 P 220-660-440	<ul style="list-style-type: none"> – Direct loss of habitat – Shoreline modification – Aquatic vegetation modifications – Disturbance of substrate – Water quality modifications 	Reduces risk of impacts The new provision requiring a eelgrass/macroalgae survey, if warranted, will reduce the risk of impacts to aquatic vegetation	No alternatives	No alternatives
Test boring in saltwater areas E New section P 220-660-450	<ul style="list-style-type: none"> – Aquatic vegetation modifications – Disturbance of substrate 	Reduces risk of impacts New WAC section will reduce the risk of impacts to water quality.	No alternative	No alternative
Informal appeal of adverse administrative actions E 220-110-340 P 220-660-460	Not applicable	No change to the risk of impacts Retain the existing language.	No alternative	No alternative
Formal appeal of administrative actions E 220-110-350 P 220-660-470	Not applicable	No change to the risk of impacts Retains the existing language.	No alternative	No alternative
Compliance E 220-110-360 P 220-110-480	Not applicable	No change to risk of impacts	No alternatives	No alternatives

4.2.2.1 Mitigating Alternative 1 – No Action Alternative

The existing Hydraulic Code Rules contain provisions that protect fish life or minimize risk of impact to fish life during hydraulic project construction. Many of these measures specifically protect the earth element. New science and technology offer us new ways to minimize or avoid impacts. Under Alternative 1, no proposed rule changes would be adopted and the rules would remain inconsistent with newer science and design technology. Because the rules would not change, we would expect no change in the type, magnitude, or distribution of effects on earth. Future effects would be expected to remain similar or identical to those occurring under existing conditions.

4.2.2.2 Mitigating Alternative 2 – WDFW-Proposed Rule Changes

Alternative 2 would reduce the risk of negative environmental impacts for earth resources, as compared to Alternative 1. This is because Alternative 2 includes new provisions that avoid and/or minimize potential physical, chemical, and biological impacts from hydraulic project activities. Changes in the type, magnitude, or distribution of effects on earth resources would be expected based on proposed provisions in Alternative 2. Future outcomes are expected to be better than those expected under the no-action alternative.

Specific provisions in Alternative 2 that mitigate for impacts to littoral drift include:

- Design pile-supported structures with maximum open space between pilings to allow waves, currents, and sediment to pass beneath.
- Minimize certain impacts from floating structures placed perpendicular to shorelines, which dampen wave action and prohibit natural shoreline erosional processes, by minimizing the size of these structures.
- Use floating breakwaters or ramps instead of breakwater walls to reduce impacts to littoral drift.

Provisions relating to dredging projects include:

- Use multi-season pre- and post-dredge project biological surveys to more extensively assess impacts to animal communities;
- Require hopper dredges, scows, barges, and trucks or any other equipment used to transport dredged materials to disposal or transfer sites to completely contain the dredged material.
- Avoid projects and expansions that convert intertidal to subtidal habitat. If such conversion is unavoidable, conduct a comprehensive, large-scale risk assessment to identify the cumulative effects of site-specific changes to ecosystem dynamics.

4.2.2.3 Mitigating Alternative 3

Provisions of Alternative 3 that could affect risk of impacts to earth resources include:

- Before allowing any form of bulkhead or armoring work, require an engineer's report that unequivocally determines that bank protection or shoreline stabilization is needed to protect infrastructure.
- If protection is warranted, require a biotechnical ("soft") solution unless an engineer clearly finds that a hard bulkhead is the only option.
- Add provisions for removing gravel and debris from small streams.

- Require permittees to install stream simulation culverts unless the permittee can show that stream simulation is not feasible, or that another design will provide equal or better protection of fish life.
- Remove the no-slope culvert design alternative.
- Require that a shorter bridge design be based on engineering constraints and not constraints caused by existing infrastructure and levee setback opportunities.
- All fish passage improvement structures would be temporary and a timeframe would be established in rule for a permanent solution to be implemented.
- Hydraulic design option culverts would have limited application in exceptional circumstances where bridges or no-slope and stream simulation culverts cannot be used.
- Before issuing an HPA to remove a beaver dam, require a professional determination that there is an imminent threat to property or the environment

4.2.2.4 Mitigating Alternative 4

Provisions of Alternative 4 that could affect risk of impacts to earth resources include:

- In the proposed rule changes, include rules for removing gravel and debris from small streams.
- Authorize dredging in fish spawning areas.
- Remove the Alternative 2 culvert design standards.
- Amend the rules to allow American Association of State Highway and Transportation Officials and Federal Highway Administration [bridge/culvert design] standards (by name)
- Amend the bridge design standards
- Amend the rules to use a channel forming flow, such as the 2-year flood, instead of a rare flood event like the 100-year to evaluate how changes in flow velocity will affect fish life.
- Delete provision to design and locate a boat ramp or launch to avoid adverse impacts to saltwater habitats of special concern.
- Delete provision to design and locate boat ramps and launches to avoid and minimize excavation below the OHWL.

4.3 Climate

Adopting the proposed Hydraulic Code Rules would not directly affect climate change; indirect effects in the form of hydrocarbon emissions are similar to those expected from any construction projects.

Outcomes related to implementing the proposed rule changes would improve conditions for fish that would help them withstand the impacts of climate change.

4.3.1 Impacts of Hydraulic Projects on Climate

When addressing the topic of climate, we considered not only the impacts of projects on climate and climate change, but also how climate changes will affect hydraulic projects

Hydraulic project construction can contribute greenhouse gas emissions, but the level of emissions is not expected to differ among the various alternatives.

Known impacts of climate change on hydraulic projects include reduction in snowpack and sea level rise. Reduced snowpack affects stream flows in summer and fall; stream flows can be further impacted by hydraulic projects. These effects are discussed in the Water Resources section.

Sea level rise is a factor affecting (or that will affect) slope failures in marine areas and the need for upgraded or new hydraulic projects for slope protection. Existing docks, terminals, boat ramps and other saltwater developments might need to be upgraded to accommodate higher sea levels. The key to climate considerations is to ensure that future hydraulic projects take sea level elevation changes into account when designing new projects.

Table 4-5 Comparison of Impacts of the Alternatives to the Climate Element

Element Impacted	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Climate Impacts	No change in risk	No change in risk	No change in risk	No change in risk
Climate Change Resilience	No change in risk	Reduction in risk	Reduction in risk	Increased risk

4.3.2 Mitigation

Provisions for hydraulic projects that protect fish life also contribute to climate change resilience. We do not anticipate that the differing provisions among the alternatives would change the annual number of hydraulic projects, so there would be no difference in impacts among the alternatives. Alternative 3 offers a provision that can raise awareness about climate-friendly project design.

4.3.2.1 Mitigating Alternative 1 – No Action Alternative

The existing Hydraulic Code Rules contain provisions that protect fish life, or minimize risk of impact to fish life, during hydraulic project construction. Many of these measures also minimize impacts to climate. New science and technology offer us new ways to minimize or avoid impacts. Under Alternative 1, no proposed rule changes would be adopted and the rules would remain inconsistent with newer science and design technology. Because the rules would not change, no change in the type, magnitude, or distribution of effects on climate would be expected. Future effects would be expected to remain similar or identical to those occurring under existing conditions.

4.3.2.2 Mitigating Alternative 2 – WDFW-Proposed Rule Changes

The proposed Alternative 2 Hydraulic Code Rules do not include any provisions that would affect climate change. It is anticipated that hydraulic projects that generate greenhouse gas emissions would continue at the same general rate as under current conditions. Alternative 2 includes new provisions that avoid and/or minimize potential physical, chemical, and biological impacts from hydraulic project activities. The proposed rule changes represented in Alternative 2 likely improve the health of those species and make them more resilient to climate change when compared to Alternative 1 outcomes.

4.3.2.3 Mitigating Alternative 3

The following provisions might improve awareness and/or contribute to more climate-friendly project design:

- Before allowing any form of bulkhead or armoring work, require an engineer's report that unequivocally determines that bank protection or shoreline stabilization is needed to protect infrastructure.
- If bank protection is warranted, require a biotechnical ("soft") solution unless an engineer clearly finds that a hard bulkhead is the only option.
- Require that placement of new and replacement structures consider climate change.

4.3.2.4 Mitigating Alternative 4

Provisions of Alternative 4 that could affect risk of impacts to climate include:

- Delete the provision "mitigation must compensate for temporal loss, uncertainty of performance, and differences in habitat functions, type, and value" because these values are difficult to quantify.
- Delete provision to design and locate boat ramps and launches to avoid adverse impacts to saltwater habitats of special concern.
- Delete provision to design and locate boat ramps and launches to avoid and minimize excavation below the OHWL.

4.4 Water Resources

As discussed in Chapter 3, water resources within Washington include streams, rivers, lakes, wetlands, estuaries, and marine areas. Key functions of aquatic natural resources include properly functioning physical and chemical processes such as natural hydrology, adequate surface and groundwater hydraulics and sediment processes, and water of sufficient quality. The level of function of such processes, in turn, directly contributes to creating and maintaining habitat for fish and wildlife.

Most changes to hydraulics project activities affected by the Alternatives would result in some direct impacts to some of the processes that support water resources, including surface water flow, groundwater, and water quality.

This section describes potential impacts to water resources that could be caused by hydraulic projects. As described in Chapter 3, WDFW does not regulate water quality, but hydraulics projects can impact water quality in several ways.

4.4.1 Surface Water Flow

This section analyses potential changes in timing and/or quantity of streamflows resulting from the four alternatives. Projects in or near water can affect the banks or bed of a channel by changing the channel itself, or through bank/bed excision or accretion during construction. Many types of hydraulic projects must divert flow away from the construction site during the construction period. All project permits contain provisions that minimize construction-related impacts, and require restoring the construction site to pre-construction conditions (or better). Post-construction monitoring is not always able to detect when site restoration (for example, replanted vegetation) has been successful.

Hydraulic project types affecting the natural flow or bed of state waters include water crossings , fish passage , flow control structures, bank protection, shoreline modifications, channel modifications, habitat modifications, water crossing structures like bridges and culverts, and overwater structures like docks, floats, and marinas.

Water crossings and culverts present their own set of challenges for applicants and regulators. In many Washington streams, hydrographs are lacking or incomplete, so the “100-year recurrence interval flood flow” cannot be determined. WDFW often recommends engineering consultations for projects that affect channel and bank protection in order to provide for the reasonable protection of fish life. Allowing sufficient room for proper floodplain function benefits not only fish (increased habitat diversity and resilience) but also people (reduced out-of-channel flooding). Because greater caution/protection is often associated with higher costs, tradeoffs between design flows and cost must be balanced by regulators and the applicant.

As a result of this rigorous design consultation, most projects make the surrounding areas more resilient to high flow events than before construction of the hydraulic project. However, occasionally a project will fail to adequately protect channels and banks in high-flow events, resulting in channel degradation, bank erosion, and adjacent flooding. Extreme rain and storm events are occurring more frequently as the climate warms, so flooding might also become more frequent. Provisions in the proposed Hydraulic Code Rules will be current with the most recent science and technology; adaptive management of the program will ensure project design stays ahead of changing conditions.

Saltwater hydraulic projects can change marine nearshore processes and geometry by altering wave energy, redirecting current, changing local flow velocities, altering nearshore circulation, and changing groundwater/surface water interactions and hyporheic exchange. Saltwater hydraulic projects that can affect water resources include flow control structures, bank protection, shoreline modifications, channel modifications, habitat modifications, and overwater structures like bridges, docks, marinas, and marine terminals.

4.4.2 Groundwater

Recharge means refilling of groundwater aquifers, as water from the land surface percolates downward into geologic units. Discharge refers to water leaving the groundwater system to enter surface lakes, rivers, or wetlands. Impacts to groundwater could result from changes in recharge to groundwater aquifers relating to changes in stream flows. Impacts could be significant if surface-water hydrology of a stream reach is altered enough to change the quantity or timing of groundwater recharge and discharge. Changes could affect groundwater discharge to surface water flows both in timing and volume of flow.

Some hydraulic projects that provide better habitat for fish also provide benefits through groundwater recharge. For example, projects that slow the flow of water to allow sediments to settle out of the water column benefit groundwater because there is a higher rate of percolation into groundwater, which could later manifest as higher late-summer flow volumes. These benefits must be balanced with detrimental effects; for example, slow moving water can have higher temperatures than faster flows.

Maintaining a strong adaptive management component to hydraulic project regulation can provide the flexibility for regulators and applicants to respond to new science about surface water/groundwater

continuity and incorporate measures that avoid or mitigate for project impacts on groundwater function.

4.4.3 Water Quality

Projects affecting the flow or bed of waters of the state can affect water quality by releasing suspended solids and increased turbidity; by increasing temperatures; through effects to dissolved oxygen, pH, and salinity; by altering pollutant and nutrient loading; through accidental release of fuel, oil, or other contaminants; and by introducing contaminants from treated wood. Water quality impacts are most often caused by hydraulic projects such as water crossings, fish passage, flow control structures, bank protection, shoreline modifications, channel modifications, habitat modifications, water crossing structures like bridges and culverts, and overwater structures like docks, floats, marinas and marine terminals. Rainfall runoff can cause disturbed sediment at construction sites to become suspended in the water column. Vessel activity associated with boat ramps and launches or marinas and marine terminals can increase suspended sediments. Reducing riparian vegetation can expose streams to more solar radiation, increasing water temperature.

Increased water temperature can change fish behavior or metabolism. The amount of oxygen available is reduced at higher water temperatures. Changing fish metabolism can make fish more prone to disease or directly cause death. Fish migration behavior and/or spawning success can be negatively impacted when passage corridors or spawning areas are unavailable to fish because the water is too warm.

Construction activities in and near water can increase risk of contaminants spreading to the aquatic environment, which can be toxic to fish and other wildlife. Preservatives used on submerged wood can be toxic, and WDFW regulates which preservatives are acceptable for hydraulic projects. Some elements in industrial discharge and stormwater are toxic to fish, which is why these activities and facilities are subject to regulation by the Clean Water Act (CWA). Some toxic chemicals can move up through the food chain, building up in the tissues of small organisms, which are eaten by fish, which in turn are eaten by larger fish, marine mammals, and humans – harming their health. The presence of toxic substances in Washington's seafood is an important consideration as Ecology implements the CWA.

While WDFW is clearly interested in improving water quality conditions as they relate to protecting fish life, a bill passed the Washington legislature in 2002 (Engrossed Substitute House Bill 2866) that clarified WDFW's authority to condition HPAs for water quality protection. The bill distinguished WDFW's authority from the authorities of Department of Ecology or U.S. Army Corps of Engineers under CWA. Generally, HPAs address the actual construction of outfalls and any associated structures, but cannot require changes to project design above the ordinary high water line. HPAs may not address secondary impacts from the discharge (i.e. degradation to water quality) when a project is covered under a National Pollution Discharge Elimination System (NPDES) municipal general permit. In areas not covered by a NPDES municipal general permit, WDFW is allowed, under certain situations, to condition HPAs for specific discharge rates to protect fish life from the direct impacts of the discharge. WDFW may recommend, but not specify, the measures required to meet prescribed discharge rates.

4.4.4 Impacts of Hydraulic Projects to Water Resources

Several hydraulic project activities have the potential to directly affect water resources by impacting sediment processes, stream hydraulics, and water quality. The overall potential physical and chemical effects, and the resulting biological effects of the activities discussed below are presented in Table 4-4, which also documents how proposed rule changes under Alternative 2 affect the impacts of these activities.

Regulated activities likely to affect overall stream hydrology include streambank protection and lake shoreline stabilization (WAC 220-110-140), dredging in freshwater areas (WAC 220-110-180), and removing sand and gravel (WAC 220-110-190). These activities would alter the physical processes of streams and other waterbodies. Pond construction (WAC 220-110-250) could also alter the hydrologic regime.

Several freshwater project activities have the potential to affect local hydraulic functions of water resources. These are activities associated with modifying stream or river beds or banks, which may in turn affect the distribution and velocity of stream flows. In addition, any project activity that may alter hydraulics also can affect sediment dynamics, including local scour depositional patterns, which are closely related. The primary project activities that have the potential to directly affect stream hydraulics and sediment mobilization and transport are as follows:

- Residential docks, watercraft lifts, and buoys in freshwater areas (WAC 220-110-150)
- Boat ramps and launches in freshwater areas (WAC 220-110-160)
- Marinas and terminals in freshwater areas (WAC 220-110-170)
- Dredging in freshwater areas (WAC 220-110-180)
- Sand and gravel removal (WAC 220-110-190)
- Water crossing structures (WAC 220-110-200)
- Fish passage improvement structures (WAC 220-110-210)
- Channel change/ realignment (WAC 220-110-220)
- Mineral prospecting WAC (220-110-310)

The project activities listed above could also lead to potential impacts related to turbidity, which could be generated while constructing or operating all of these project types. In addition, project activities involving outfall structures in saltwater areas (WAC 220-110-430) and outfall structures in freshwater areas (WAC 220-110-270) could also increase turbidity.

Lastly, project activities that alter the marine shoreline or benthos can also result in direct changes to local drift cells and alter shoreline sediment transport dynamics. Direct effects on marine water resources could result from the following project activities (see Table 4-4 for more details):

- Bulkheads and other bank protection in saltwater areas (WAC 220-110-370)
- Residential docks (piers, ramps, and floats), buoys and other overwater structures in saltwater areas (WAC 220-110-380)
- Boat ramps and launches in saltwater areas (WAC 220-110-390)
- Marinas and terminals in saltwater areas (WAC 220-110-400)
- Dredging in saltwater areas (WAC 220-110-410)

Flooding can occur when culverts are undersized, when beavers build dams, and when large woody material is placed in streams to slow water velocities. Provisions of the Hydraulic Code Rules are intended to ensure that placement and sizing of culverts and large wood can withstand extreme conditions without failure under most foreseeable conditions. Beaver management decisions (such as a dam removal) are carefully considered so that impacts of the removal are minimized.

Table 4-6 Comparison of Impacts of the Alternatives to the Water Resources Element

Element Impacted	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Water Resource Hydrology	No change in risk	Reduction in risk	Same as Alternative 2	Increased risk
Groundwater	No change in risk	Same as Alternative 1	Same as Alternative 2	Same as Alternative 2
Water Quality	No change in risk	Reduction in risk	Further reduction in risk	Increased risk

4.4.5 Mitigation for Impacts to Water Resources

The hydraulic code rules are designed to allow construction projects while providing adequate protection for fish life. Many elements of the environment, taken together, define the habitat in which fish live, and so the Hydraulic Code Rules include provisions that minimize or “mitigate” for impacts to those environmental elements.

4.4.5.1 Mitigating Alternative 1 – No Action Alternative

The existing Hydraulic Code Rules contain provisions that protect fish life, or minimize risk of impact to fish life, during hydraulic project construction. Many of these measures also protect water resources. New science and technology offer us new ways to minimize or avoid impacts. Under Alternative 1, no proposed rule changes would be adopted and the rules would remain inconsistent with newer science and design technology. Because the rules would not change, no change in the type, magnitude, or distribution of effects on water resources would be expected. Future effects would be expected to remain similar or identical to those occurring under existing conditions.

4.4.5.2 Mitigating Alternative 2 – WDFW-Proposed Rule Changes

Alternative 2 would reduce the risk of negative environmental impacts for water resources, as compared to Alternative 1. This is because Alternative 2 includes new provisions that avoid and/or minimize potential physical, chemical, and biological impacts from hydraulic project activities. Changes in the type, magnitude, or distribution of effects on water resources would be expected based on proposed provisions in Alternative 2. Future outcomes are expected to be better than those under the no-action alternative. Examples of such measures include explicit requirements for the following:

- A professional assessment of risk and justification for project;
- More robust design requirements that will minimize impacts to habitat; and

- Construction methods (e.g., vibratory versus impact pile driving) and material (e.g., specifications for type, size, and composition) requirements will minimize impacts to fish and habitat.

Alternative 2 provisions that reduce risk of impacts from freshwater hydraulic projects include:

- Set staging areas in a location and manner that prevents contaminants from entering water.
- Protect areas exposed during construction.
- Route the construction water (wastewater) from the project to an upland area above the limits of anticipated floodwater.
- Locate the structure deep enough to avoid prop wash re-suspension of sediments and contaminants.
- Prevent transporting and introducing aquatic invasive species by thoroughly cleaning vessels, equipment, boots, waders, and other gear.
- Do not use wood treated with oil-type preservative. Wood treated with waterborne preservative chemicals may be used if the Western Wood Preservers Institute has approved its use in the aquatic environment.
- Completely contain treated wood sawdust, trimmings, and drill shavings.
- Structures built of treated wood should incorporate features to prevent or minimize the abrasion of treated wood by floats, ramps, or vessels.

Alternative 2 provisions that mitigate impacts to saltwater circulation include:

- Design pile-supported structures with maximum open space between pilings to allow waves, currents, and sediment to pass beneath.
- Minimize certain impacts from floating structures placed perpendicular to shorelines, which dampen wave action and inhibit natural shoreline erosional processes, by minimizing the size of these structures.
- Use floating breakwaters or ramps instead of breakwater walls to reduce impacts to littoral drift

4.4.5.3 Mitigating Alternative 3

Alternative 3 proposals affecting water resources include provisions that could further reduce the risk of impacts to water resources over the measures provided in Alternative 2. A provision to require an applicant to demonstrate he/she has a valid water right to apply for HPA for water diversions might reduce risk to water resources.

The following provisions of Alternative 3 could reduce risk to water flow and hydrology:

- A tee diffuser outfall would be the only design method authorized in low flow situations.
- Require that conduit lines in watercourses would not constrict the channel or preclude future opportunities for bridges or other less-impacting approaches to water crossings.
- Before allowing any form of bulkhead or armoring work, require an engineer's report that unequivocally determines that bank protection or shoreline stabilization is needed to protect infrastructure.
- If bank protection is warranted, require a biotechnical ("soft") solution unless an engineer clearly finds that a hard bulkhead is the only option.

The following provision would reduce risk to water quality:

- The use of all treated wood and tires would be prohibited.

These Alternative 3 provisions might increase risk of flooding:

- Before issuing an HPA for removal of a beaver dam, require a professional determination that there is an imminent threat to property or the environment
- Require scientific justification to prove that dredging will resolve flooding problems before any HPAs for dredging are issued.

Rule changes proposed in Alternative 3 further reduce the likelihood of water quality degradation because this alternative prohibits the use of any wood preservative for submerged wood. Alternative 3 provisions might increase the risk of flooding impacts.

4.4.5.4 Mitigating Alternative 4

Alternative 4 proposals that affect risk for water resources include:

- Remove the culvert design standards.
- Amend the rules to use a channel forming flow, such as the 2-year flood, instead of a rare flood like the 100-year to evaluate how changes in flow velocity will affect fish life.
- Delete the provision to design and locate the boat ramp or launch to avoid adverse impacts to saltwater habitats of special concern.
- Delete the provision to design and locate boat ramps and launches to avoid and minimize excavation below the OHWL.
- Remove all grating requirements.

4.5 Wildlife

As discussed in Chapter 3, marine mammals, birds, reptiles, and amphibians utilize the riverine, marine, and wetland habitats in Washington. Some of these species spend all of their lives in or near the wetted perimeter of rivers, streams, wetlands, and oceans while many others use such areas only for specific life history stages, such as breeding, feeding, and migration. Other wildlife species utilize upland habitats where hydraulic project activities could occur.

Most changes to the hydraulic project activities regulated by Alternative 2 would not result in direct impacts to most wildlife species. This is because:

- Most of the project activities with proposed rule changes would not affect individuals directly, but affect their habitats and prey items;
- Most wildlife species are mobile and able to walk, fly, or swim away from disturbances such as noise, light, human activity, or turbidity; and
- The vast majority of hydraulics project activities occur in areas that already have some level of development and human activity, areas that would generally be avoided by many of the wildlife species discussed in Chapter 3.

Wildlife that are at risk of direct effects from hydraulics project activities include the following:

- Amphibians associated with the wetted perimeter of freshwater streams, rivers, lakes, and wetlands. The habitat range and mobility of these species are somewhat limited and amphibians and reptiles are widely distributed throughout the landscape, including areas that have some level of existing development, indicating a susceptibility to direct effects from physical harm and/or stranding of larval forms.
- Marine animals that are sensitive to in-water or in-air disturbances (particularly from noise and vibration) and that have at least moderate utilization of marine nearshore/shoreline areas. This would include pinnipeds, cetaceans, and diving birds.
- Aquatic wildlife that uses marine or lacustrine benthic habitat or riverine bed habitat for feeding or migration. Such wildlife species (e.g., diving ducks) could be injured or killed by certain hydraulic project activities, such as dredging.
- Wildlife that use streams, lakes, rivers, or the freshwater shoreline for nesting or denning. This includes beaver, muskrat, nutria, river otter, and similar wildlife species.

4.5.1 Impacts of Hydraulic Projects to Wildlife

Hydraulic project activities may directly affect some of the wildlife species in Washington. Project activities that could result in direct effects to wildlife are discussed below.

Several hydraulic project activities have potential to directly affect marine mammals and diving birds in marine habitat, due primarily to potential acoustic impacts and physical entrainment:

- Bulkheads and other bank protection in saltwater areas (WAC 220-110-360)
- Residential piers, ramps, floats, watercraft lifts, and buoys in saltwater areas (WAC 220-110-370)
- Boat ramps and launches in saltwater areas (WAC 220-110-380)
- Marinas and terminals in saltwater areas (WAC 220-110-390)
- Dredging in saltwater areas (WAC 220-110-400)
- Outfall and tide and flood gate structures in saltwater areas (WAC 220-110-420)

Likewise, some freshwater wildlife species may be exposed to direct impacts from hydraulic project activities. These impacts would result primarily from stranding and entrainment of amphibian species or effects from entrainment on benthic species. Such activities include:

- Residential docks, watercraft lifts, and buoys in freshwater areas (WAC 220-110-140)
- Boat ramps and launches in freshwater areas (WAC 220-110-150)
- Marinas and terminals in freshwater areas (WAC 220-110-160)
- Dredging in freshwater areas (WAC 220-110-170)
- Sand and gravel removal (WAC 220-110-180)
- Water crossing structures (WAC 220-110-190)
- Fish passage improvement structures (WAC 220-110-200)
- Channel change/ realignment (WAC 220-110-210)
- Mineral prospecting WAC (220-110-300)

Two hydraulic project activities could directly affect certain wildlife species or species groups. Streambank protection and lake shoreline stabilization activities (WAC 220-110-130) could result in death or injury from destruction of the primary habitats (e.g., active dens in disturbed shoreline

habitats) of bank-dwelling mammals and birds and beaver dam management activities (WAC 220-110-230) could result in similar effects on beaver.

Most of the potential effects on wildlife would be indirect effects from habitat alteration, changes to physical or biological ecological functions (e.g., water quality), or alterations on a wildlife species predator or prey (e.g., fish).

Development in general can contribute to ecosystem fragmentation, for both aquatic and terrestrial animals. Specific effects include:

- Altered longitudinal (up and down stream) connectivity
- Altered lateral connections between rivers and floodplains
- Loss of access to floodplain habitats
- Altered habitat complexity
- Loss of riparian cover

Project types most often associated with ecosystem fragmentation impacts to wildlife include water crossings, fish passage, flow control structures, bank protection, shoreline modifications, channel modifications, habitat modifications, and overwater structures.

Table 4-7 Comparison of Impacts of the Alternatives to the Wildlife Element

Element Impacted	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Wildlife and Ecosystem Impacts	No change in risk	No change in risk	Reduction in risk	Increased risk

4.5.2 Mitigation

The rules associated with regulated hydraulic project activities are intended to avoid and minimize effects on wildlife and other natural resources.

Removing beaver dams may directly injure or kill beavers because the primary aim of this activity is to destroy beaver habitat. Although no explicit mitigation measures are specified, the proposed rule prioritizes beaver dam removal methods that would have minimal effects on other wildlife, fish, and water resources. It also requires that removal of established beaver dams be conducted only when other measures for controlling beaver damage have not been effective.

4.5.2.1 Mitigating Alternative 1 – No Action Alternative

The existing Hydraulic Code Rules contain provisions to protect fish life, or minimize risk of impact to fish life, during hydraulic project construction. Many of these measures also protect wildlife and ecosystems. New science and technology offer us new ways to minimize or avoid impacts. Under Alternative 1, no proposed rule changes would be adopted and the rules would remain inconsistent with newer science and design technology. Because the rules would not change, no change in the type, magnitude, or distribution of effects on wildlife would be expected. Future effects including injury,

mortality, and behavioral changes, as well as effects on habitat, predators, or prey, would be expected to remain similar or identical to those occurring under existing conditions.

4.5.2.2 Mitigating Alternative 2 – WDFW-Proposed Rule Changes

Alternative 2 would reduce the risk of negative environmental impacts for wildlife resources, as compared to Alternative 1. This is because Alternative 2 includes new provisions that avoid and/or minimize potential physical, chemical, and biological impacts from the individual hydraulic project activities. Changes in the type, magnitude, or distribution of effects on wildlife resources would be expected based on proposed provisions in Alternative 2. Future outcomes are expected to be better than those under the no-action alternative. General examples of such measures include explicit requirements for the following:

- A professional assessment of risk and justification for project;
- More robust design requirements that will minimize impacts to habitat;
- Construction methods (e.g., vibratory versus impact pile driving) and material (e.g., specifications for type, size, and composition) requirements will minimize impacts to fish and habitat; and
- Work windows that will minimize overlap of authorized work with presence of relevant life history stages of fish.

4.5.2.3 Mitigating Alternative 3

Provisions of Alternative 3 that could affect risk of impacts to wildlife include:

- Require mooring buoys to be a certain distance from seagrass and macroalgae.
- New and expanded docks, wharves, piers, marinas, rafts, shipyards and terminals must be at least a specified buffer distance from existing native aquatic vegetation attached to or rooted in substrate.

4.5.2.4 Mitigating Alternative 4

Provisions of Alternative 4 that could affect risk of impacts to wildlife include:

- Delete the provision "mitigation must compensate for temporal loss, uncertainty of performance, and differences in habitat functions, type, and value".
- No pier height or width requirements would be specified for waterbodies where impacts to juvenile salmonid migration corridors and feeding and rearing areas are a concern.
- Delete the provision to design and locate the boat ramp or launch to avoid adverse impacts to saltwater habitats of special concern.
- Delete the provision to design and locate boat ramps and launches to avoid and minimize excavation below the OHWL.

4.6 Vegetation

As described in Chapter 3, the shorelines and shallow waters of the state's freshwater and marine watercourses support diverse vegetation. Many hydraulic project activities can result in direct or indirect impacts to vegetation. Vegetation that might be impacted includes:

- Riparian vegetation associated with freshwater river and stream corridors and lake shorelines. This is likely to include deciduous shrubs and/or trees and coniferous trees in some areas;
- Wetland vegetation associated with emergent, shrub, or forest wetland communities present adjacent to streams or lakes;
- Riparian vegetation associated with marine shorelines including deciduous and coniferous shrubs and trees;
- Salt-tolerant vegetation present in backshore beaches including grasses and herbaceous species;
- Submerged and floating aquatic vegetation associated with the shoreline of freshwater lakes; and
- Submerged and floating aquatic vegetation associated with shallow marine waters along shorelines and estuaries.

4.6.1 Impacts of Hydraulic Projects to Vegetation

Hydraulic project activities may directly impact some of the vegetation species associated with freshwater rivers, streams and lakes, and marine shorelines. Impacts to vegetation could occur while constructing and/or operating a project.

In terms of construction, the revised Hydraulic Code Rules contain numerous requirements and recommendations that would reduce impacts to riparian, wetland, and aquatic vegetation. Overall, the general construction requirements for all hydraulic projects include provisions to minimize disturbance from construction by avoiding to the maximum extent practicable and then minimizing disturbance to aquatic and wetland plants (except aquatic noxious weeds), riparian and wetland areas, replacing vegetation following construction, and monitoring the replaced vegetation.

Several hydraulic project activities could directly affect vegetation because they require in-water or on-land construction in areas where vegetation is typically present. Such activities include:

- Streambank protection and lake shoreline stabilization (WAC 220-110-130)
- Residential docks, watercraft lifts, and buoys in freshwater areas (WAC 220-110-140)
- Boat ramps and launches in freshwater areas (WAC 220-110-150)
- Marinas and terminals in freshwater areas (WAC 220-110-160)
- Water crossing structures (WAC 220-110-190)
- Channel change/ realignment (WAC 220-110-210)
- Outfall structures in freshwater areas (WAC 220-110-260)
- Bulkheads and other bank protection in saltwater areas (WAC 220-110-360)
- Residential piers, ramps, watercraft lifts, and buoys in saltwater areas (WAC 220-110-370)
- Boat ramps and launches in saltwater areas (WAC 220-110-380)
- Marinas and terminals in saltwater areas (WAC 220-110-390)
- Dredging in saltwater areas (WAC 220-110-400)
- Outfall and tide and flood gate structures in saltwater areas (WAC 220-110-420)

Alteration or loss of aquatic vegetation:

Impacts to aquatic vegetation ripple throughout aquatic ecosystems:

- Changes to water quality
- Loss of refugia and cover
- Altered flow pattern
- Altered nutrient cycling pattern
- Increased risk of predation
- Altered production of habitat-forming materials from off-site
- Altered habitat complexity

Alteration or loss of riparian vegetation

Alteration or loss of riparian vegetation can result in:

- Reduced shading and altered temperature regime
- Reduced streambank or shoreline stability
- Altered inputs of habitat-forming materials from off-site (including large woody material)
- Altered groundwater, surface water and hyporheic exchange
- Altered habitat complexity

Beneficial project types:

Two hydraulic project types are intended to have beneficial effects on aquatic vegetation. Aquatic plant removal and control (WAC 220-110-290) covers the physical and mechanical methods for removing aquatic noxious weeds (e.g., *Spartina* sp. and purple loosestrife) that threaten native vegetation, and fish and shellfish and their habitat. Seagrass and macroalgae habitat surveys (WAC 320-110-350) include specific guidelines for surveying seagrass and macroalgae habitats to improve protection and preservation. The proposed rule changes contain protocols for both preliminary and advanced surveys to assist in evaluating the potential impacts associated with other regulated hydraulic project activities such as new or replacement docks, mooring buoys, or other overwater structures, and new or maintenance dredging, trenching, filling or grading.

Table 4-8 Comparison of Impacts of the Alternatives to the Vegetation Element

Element Impacted	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Aquatic and Riparian Vegetation	No change in risk	Reduction in risk	Further reduction in risk	Increased risk

4.6.2 Mitigation

The rules associated with regulated hydraulic project activities that minimize or avoid impacts to fish life also reduce risk of impacts to vegetation. Some provisions are intended specifically to avoid or minimize impacts to vegetation.

4.6.2.1 Mitigating Alternative 1 – No Action Alternative

The existing hydraulic code rules contain provisions to protect fish life, or minimize risk of impact to fish life, during hydraulic project construction. Many of these measures also protect aquatic and/or riparian

vegetation. New science and technology offer us new ways to minimize or avoid impacts. Under Alternative 1, no proposed rule changes would be adopted and the rules would remain inconsistent with newer science and design technology. Because the rules would not change, no change in the type, magnitude, or distribution of effects on vegetation would be expected. Future effects would be expected to remain similar or identical to those occurring under existing conditions.

4.6.2.2 Mitigating Alternative 2 – WDFW-Proposed Rule Changes

Alternative 2 would reduce the risk of negative environmental impacts for vegetation, as compared to Alternative 1. This is because the Preferred Alternative includes provisions to avoid and minimize impacts to vegetation during construction, provides specific guidelines to avoid and minimize impacts to vegetation for many of the hydraulic activities, and two of the regulated activities are expected to have beneficial effects on vegetation. Changes in the type, magnitude, or distribution of effects on vegetation would be expected based on proposed provisions in Alternative 2. Future outcomes are expected to be better than those under the no-action alternative.

The proposed rule changes include provisions to minimize disturbance to vegetation and are expected to reduce direct impacts to vegetation associated with the activities listed above. We expect that regulated activities that occur between the banks or waterward of shorelines could generally avoid impacts to vegetation. These activities include:

- Dredging in freshwater areas (WAC 220-110-170),
- Sand and gravel removal (WAC 220-110-180),
- Fish passage improvement structures (WAC 220-110-200),
- Water diversions and intakes (WAC 220-110-250),
- Utility crossings in freshwater areas WAC (220-110-270) and saltwater areas (WAC 220-110-430),
- Mineral prospecting (WAC 220-110-300), and
- Boring in saltwater areas (WAC 220-110-440).

Alternative 2 provisions that reduce risk to aquatic vegetation:

- Locate structures in deeper water to minimize shading and physical impacts on aquatic vegetation.
- Minimize impacts from vessels.
- Do not allow floats to ground out on low tides.
- Any walkways should be 100 percent grated; floats and docks should be at least 60 percent grating.
- Orient grating to maximize transmission of light under the structure.
- Minimize the amount of pier area that directly contacts the shoreline, to allow light penetration to the nearshore intertidal and shallow subtidal areas.

Provisions that reduce risk to riparian vegetation:

- Use existing roadways or travel paths whenever possible
- Use hand equipment rather than heavy equipment
- If using heavy equipment, use wide-track or rubberized tires

4.6.2.3 Mitigating Alternative 3

Provisions of Alternative 3 that could affect risk of impacts to vegetation include:

- Before allowing any form of bulkhead or armoring work, require an engineer's report that unequivocally determines that bank protection or shoreline stabilization is needed to protect infrastructure.
- If protection is warranted, require a biotechnical ("soft") solution unless an engineer clearly finds that a hard bulkhead is the only option.
- Require 100% of an overwater structure's deck to be covered in grating.
- Require mooring buoys to be a certain distance from seagrass and macroalgae.
- New and expanded docks, wharves, piers, marinas, rafts, shipyards and terminals must be at least a specified buffer distance from existing native aquatic vegetation attached to or rooted in substrate.

4.6.2.4 Mitigating Alternative 4

Provisions of Alternative 4 that could affect risk of impacts to vegetation include:

- Delete the provision "mitigation must compensate for temporal loss, uncertainty of performance, and differences in habitat functions, type, and value" because these values are difficult to quantify.
- Remove all grating requirements
- No pier height or width requirements would be specified for waterbodies where impacts to juvenile salmonid migration corridors and feeding and rearing areas are a concern.
- Authorize dredging in fish spawning areas.
- Amend the rules to allow American Association of State Highway and Transportation Officials and Federal Highway Administration [bridge/culvert design] standards (by name)
- Remove the culvert design standards.
- Amend the bridge design standards.
- Amend the rules to use a channel forming flow, such as the 2-year flood, instead of a rare flood like the 100-year to evaluate how changes in flow velocity will affect fish life.
- Delete the provision to design and locate the boat ramp or launch to avoid adverse impacts to saltwater habitats of special concern.
- Delete the provision for the department to require an eelgrass/macroalgae habitat survey for all new ramp or launch construction. A survey is not required to replace an existing structure within its original footprint.
- Delete the provision to design and locate boat ramps and launches to avoid and minimize excavation below the OHWL.

4.7 Built Environment

The Hydraulic Code Rules provide provisions for what can be constructed on private and public property and how the projects would be constructed. The provisions have broad environmental effects because

fish habitat comprises a significant portion of freshwater and nearshore saltwater environments, which are also shared with human uses.

New design standards for some project types could increase costs of constructing such projects. Costs could also increase because the proposed new rules provide mitigation provisions that apply to most projects.

Probable significant adverse environmental impacts would be determined on a project-specific basis for hydraulic projects requiring additional environmental review. To help us think about the effects of proposed Hydraulic Code Rules on “the built environment,” this section is designed to put forward some types of impacts to the built environment that might occur for particular hydraulic project types.

4.7.1 Environmental Health and Safety

Safety of people and property is an important consideration when hydraulic projects are being evaluated for permitting. Provisions in statute allow immediate permitting under emergency situations declared by WDFW or a county government. Two other types of permits, imminent danger and chronic danger, are addressed in statute. The rule change proposals incorporate procedures to improve implementation of projects under these circumstances.

In some cases, there is debate regarding the designs that would be best for both fish and people. Some proposed rule changes provide provisions for professionally-engineered designs when project proponents and permit biologists do not agree on the project design in highly sensitive locations (marine bank protection, for example). WDFW works together with the proponent and his/her design engineer to ensure that the project is protective of both human and fish needs.

Concern about flooding is a frequent discussion topic. For example, beaver dams and placement of large wood pieces are both intended to slow the natural flow of a stream, but these structures sometimes cause blockages during high flow conditions. Design technology has evolved regarding selection and placement of artificial habitat elements, and flooding at high flows is less of a problem for these types of projects now. We still can't always get beavers to cooperate with our human development plans, but provisions are proposed in the rule revisions that facilitate decisions on beaver management techniques.

Undersized culverts and road crossings can also cause local flooding during high-flow events. Existing and proposed new hydraulic project provisions help to ensure that new structures involving fish passage improvements will also provide benefits in terms of reduced risk of localized flood impacts. One of the interesting challenges of adapting to climate change is that flow patterns and volumes are changing from those we have experienced in the past. Human development has also changed hydrology in some streams. Locations that have not historically been susceptible to “flash floods” can now be affected. Rule changes represented by the proposed alternatives should reduce risk of flood impacts.

Discussions about fuel spills and toxic contaminants occur in Section 4.3 and are not repeated here.

4.7.1.1 Existing conditions (Alternative 1) that affect environmental health and safety

Under Alternative 1, impacts to environmental health and safety from hydraulic projects would remain the same as under current conditions.

4.7.1.2 Provisions of Alternative 2 that affect environmental health and safety

New construction provisions included in Alternative 2 that are intended to improve conditions for fish life probably also offer more conservative work methods and designs that improve public safety. Provisions of Alternative 2 relating to hydraulic project design potentially can decrease effects like flooding, which improves overall safety of these structures. New provisions for beaver management help people remove property impacts from beaver activity. Provisions for the type of wood preservative used for water-contact projects help improve overall environmental health. These are discussed in greater detail in the water quality section.

4.7.1.3 Provisions of Alternative 3 that affect environmental health and safety.

- Prohibit the use of all treated wood and tires.
- Before allowing any form of bulkhead or armoring work, require an engineer's report that unequivocally determines that bank protection or shoreline stabilization is needed to protect infrastructure.
- If protection is warranted, require a biotechnical ("soft") solution unless an engineer clearly finds that a hard bulkhead is the only option.
- Require scientific justification to prove that dredging will resolve flooding problems before any HPAs for dredging are issued.
- Before issuing an HPA to remove a beaver dam, require a professional determination that there is an imminent threat to property or the environment.

4.7.1.4 Provisions of Alternative 4 that affect environmental health and safety

- Remove all grating requirements.
- Amend the rules to use a channel forming flow, such as the 2-year flood, instead of a rare flood like the 100-year to evaluate how changes in flow velocity will affect fish life.

4.7.2 Land and Shoreline Use

Hydraulic code rules do not directly affect land and shoreline use because the construction of hydraulic projects must be consistent with existing land use regulations, including zoning code restrictions, critical areas regulations, and Shoreline Management Programs. However, hydraulic projects can profoundly affect land/shoreline use because hydraulic projects are primarily construction projects intended to convert land from one use to another or to improve an existing use.

4.7.2.1 Existing conditions (Alternative 1) that affect land and shoreline use

Under Alternative 1, hydraulic projects would continue to be regulated under the existing Hydraulic Code Rules, which are inconsistent with some aspects of the Shoreline Management Act, some local critical areas ordinances, and other regulations. This inconsistency causes uncertainty among landowners about how projects should be constructed and lengthen the time required to permit a hydraulic project.

4.7.2.2 Provisions of Alternative 2 that affect land and shoreline use

The proposed rule changes increase the restrictions on hydraulic project construction beyond the existing regulations. They also further limit what can be constructed and where. For example, ponds

could no longer be constructed within a watercourse (WAC 220-110-240). In addition, the revised code limits the location of marinas and terminals (WAC 220-110-160 and 390).

4.7.2.3 Provisions of Alternative 3 that affect land and shoreline use

- Before allowing any form of bulkhead or armoring work, require an engineer's report that unequivocally determines that bank protection or shoreline stabilization is needed to protect infrastructure.

4.7.2.4 Provisions of Alternative 4 that affect land and shoreline use

- No pier height or width requirements would be specified for waterbodies where impacts to juvenile salmonid migration corridors and feeding and rearing areas are a concern.
- Delete the provision to design and locate the boat ramp or launch to avoid adverse impacts to saltwater habitats of special concern.
- Delete the provision to design and locate freshwater boat ramps and launches to avoid and minimize excavation below the OHWL.

4.7.2.5 Mitigation

Although the proposed Hydraulic Code Rule changes in Alternative 2 impose more restrictions on locations of hydraulic projects, the new rules would provide certainty about locating the projects. Current implementation of the existing rules also places limits on project locations through project specific restrictions, but those limits are not specified in the existing rule language, which has created uncertainty for landowners/developers. The proposed rule changes will improve certainty to landowners about location requirements, which may somewhat offset the new restrictions by making it easier for project proponents to know what is required before applying for an HPA.

4.7.3 Light, Glare, Noise, and Aesthetics

Projects that generate noise include water crossings, fish passage, flow control structures, bank protection, shoreline modifications, channel modifications, habitat modifications, and overwater structures.

Projects that can affect ambient light include overwater structures, fish passage, and channel modifications. The effects of light are discussed in the sections covering Fish and Vegetation.

Aesthetics are affected by any construction project. Most projects are unattractive when under construction. Many hydraulic projects permanently alter a natural landscape to a built landscape, with the associated changes in aesthetics. However, project provisions that protect fish life also preserve or restore near-natural conditions, and so maintain or restore the natural aesthetic.

For example, bank protection structures can present unattractive built elements in the otherwise natural landscape. New provisions and considerations for bank protection projects that reduce/minimize impacts to fish life, such as use of soft-shore protection alternatives, can also produce more aesthetically pleasing designs, especially to the landowner wishing to restore the natural beach of their waterfront property.

4.7.3.1 Existing conditions (Alternative 1) that affect light, glare, noise, and aesthetics

There are currently no provisions for attenuating noise from pile driving. Current provisions for project activities within the beach area prohibit work when the project area, including the work corridor, is undated by tidal waters unless the work is occurring from a vessel or barge. Provisions relating to light penetration on docks and floats exist, but they do not reflect current design and technology improvements.

4.7.3.2 Provisions of Alternative 2 that affect light, glare, noise, and aesthetics

Alternative 2 includes the following proposed provisions, which are intended to reduce impacts to fish life but also reduce the overall risks of impact from noise.

Pile driving

- When installing steel piling, a vibratory hammer is preferred.
- If impact pile driving is needed, set the drop height to the minimum needed to drive the piling.
- Use appropriate sound attenuation to minimize harm to fish from impact steel pile-driving noise.

Equipment use

- Avoid and minimize the use of equipment below the OHWL of rivers, streams, and lakes.
- Avoid and minimize use of equipment on the beach area and confine equipment to specific access and work corridors.
- Project activities within the beach area must not occur when the project area, including the work corridor, is inundated by tidal waters unless the work is occurring from a vessel or barge.

Provisions relative to light penetration through decking are discussed in Section 4.1.

4.7.3.3 Provisions of Alternative 3 that affect light, glare, noise, and aesthetics

Provisions for Alternative 3 are the same as for Alternative 2.

4.7.3.4 Provisions of Alternative 4 that affect light, glare, noise, and aesthetics

Alternative 4 removes existing provisions relating to noise, light, and aesthetics, and deletes some provisions proposed in Alternative 2:

- Remove all grating requirements
- No specified pier height or width requirements for waterbodies where impacts to juvenile salmonid migration corridors and feeding and rearing areas are a concern
- Delete the provision to design and locate boat ramps or launches to avoid adverse impacts to saltwater habitats of special concern

4.7.4 Recreation

Water-oriented recreation in Washington often revolves around docks, piers, boat launches and marinas. These structures are all regulated under the Hydraulic Code Rules.

4.7.4.1 Existing conditions (Alternative 1) that affect recreation

The existing Hydraulic Code Rules include provisions for constructing freshwater docks, piers, and floats and driving or removing piling (existing WAC 200-110-060); freshwater boat hoists, ramps, and launches (existing WAC 220-110-224); saltwater boat ramps and launches (existing WAC 220-110-290); saltwater piers, pilings, docks, floats, rafts, ramps, boathouses, houseboats, and associated moorings (existing WAC 220-110-300); and marinas in saltwater areas (existing WAC 220-110-330). Recreation-related hydraulic projects are also regulated site-by-site when necessary to protect fish life. These provisions currently limit locations, construction methods, and dimensions of structures built for water-oriented recreation. Under Alternative 1, impacts on recreation would remain the same as under current conditions.

4.7.4.2 Provisions of Alternative 2 that affect recreation

Hydraulic Code Rules for recreation-related structures have been significantly revised to match current fish science and design technology. Revised WACs 220-110-140 (Residential docks, watercraft lifts, and buoys in freshwater areas), 220-110-150 (Boat ramps and launches in freshwater areas), 220-110-160 (Marinas and terminals in freshwater areas), 220-110-370 (Residential piers, ramps, floats, watercraft lift and buoys in saltwater areas), 220-110-380 (Boat ramps and launches in saltwater areas) and 220-110-390 (Marinas and terminals in saltwater areas) all regulate recreation-related hydraulic projects. Changes to each section are summarized in Table 4-4.

In these sections, new regulations have been added covering activities that were not previously included in the Hydraulic Code Rules, including watercraft lifts, mooring buoys, piers, ramps, floats, grating and paint, treated wood, piling, noise and pile driving, and piling removal. Marinas and terminals in freshwater areas have been added as a regulated activity, with requirements similar to those for marinas and terminals in saltwater areas. Length, width, and grating requirements have been added for residential docks, and existing requirements have been substantially changed based on current best practices. Boat ramps and launches are no longer allowed to be located in spawning areas. Allowable dock designs have been specified for waterbodies with salmon, steelhead, and bull trout. These regulatory changes would add constraints on where and how docks, ramps, and marinas could be constructed. Added design requirements would add to the cost and time needed to construct recreational structures. Recreational development under the revised hydraulic code rules would be more constrained than under current conditions.

Changes to the Hydraulic Code Rules that protect fish species are discussed in Section 4.1. These changes would help maintain fish productivity and improve fishing opportunities. Changes to the Hydraulic Code Rules that protect water quality are discussed in Section 4.3. These changes would maintain and improve water quality for water-contact recreation (such as swimming) as well as fishing opportunities.

4.7.4.3 Provisions of Alternative 3 that affect recreation

Alternative 3 provisions are the same as for Alternative 2, except for the following:

- Require 100% of an overwater structure's deck to be covered in grating.
- Impose additional timing restrictions for mineral prospecting.

4.7.4.4 Provisions of Alternative 4 that affect Recreation

- Retain the Alternative 1 timing windows for mineral prospecting.
- Delete the provision to design and locate the boat ramp or launch to avoid adverse impacts to saltwater habitats of special concern.
- Delete the provision for the department to require an eelgrass/macroalgae habitat survey for all new ramp or launch construction. A survey is not required to replace an existing structure within its original footprint.
- Delete the provision to design and locate boat ramps and launches to avoid and minimize excavation below the OHWL.

4.7.4.5 Mitigation

Water-oriented recreational development and public access to water are among the prioritized uses under the Shoreline Management Act (SMA) and individual Shoreline Master Programs enacted by cities and counties in the state. The revisions to the Hydraulic Code Rules proposed in Alternative 2 bring the rules into consistency with the SMA. While new regulations for docks, launches, and marinas could increase design and construction time for these structures, procedural improvements for hydraulic permits could offset some of this increase. Additionally, including detailed regulations in the code rules instead of relying on site-by-site provisions to protect fish would help assure developers that certain recreational structures will be allowed and will minimize the need to revise designs during the permitting process.

4.7.5 Historic and Cultural Resources

As described in Section 3, there is a high probability of encountering cultural resources when hydraulic projects are constructed. Neither the existing or revised Hydraulic Code Rules include requirements to protect cultural resources; however, other state and federal regulations do require protection of those resources and those regulations would usually be triggered by hydraulic project construction.

4.7.5.1 Existing conditions (Alternative 1) that affect historic and cultural resources

Impacts to cultural resources from hydraulic projects would remain the same as under current conditions.

4.7.5.2 Provisions of Alternative 2 that affect historic and cultural resources

The revised Hydraulic Code Rules do not include requirements to protect cultural resources; therefore, protection of cultural resources would continue to be provided by other regulations (Section 1). Provisions in the proposed Hydraulic Code Rules (Alternative 2) that reduce the footprint of hydraulic projects would help reduce potential impacts to cultural resources by reducing the amount of soil disturbance.

4.7.5.3 Provisions of Alternative 3 that affect historic and cultural resources

Several provisions of Alternative 3 affect the footprint of the disturbed area during hydraulic project construction, and would therefore reduce risk of impacts to historic and cultural resources:

- Before allowing any form of bulkhead or armoring work, require an engineer's report that unequivocally determines that bank protection or shoreline stabilization is needed to protect infrastructure.
- If protection is warranted, require a biotechnical ("soft") solution unless an engineer clearly finds that a hard bulkhead is the only option.
- Add provisions for removing gravel and debris from small streams.
- Require scientific justification to prove that dredging will resolve flooding problems before any HPAs for dredging are issued.
- Require permittees to install stream simulation culverts unless the permittee can show that stream simulation is not feasible, or that another design will provide equal or better protection of fish life.
- Retain the current (Alternative 1) WDFW priorities for water crossings.
- Remove the no-slope design alternative
- Require a shorter bridge design be based on engineering constraints and not constraints caused by existing infrastructure and levee setback opportunities.
- Hydraulic design option culverts would have limited application in exceptional circumstances where constraints prevent the use of bridges, no-slope, and stream simulation culverts.
- Require that conduit lines in watercourses would not constrict the channel or preclude future opportunities for bridges or other less-impacting approaches to water crossings.

4.7.5.4 Provisions of Alternative 4 that affect historic and cultural resources

Several provisions of Alternative 4 might affect the footprint of the disturbed area during hydraulic project construction, and might therefore affect the risk of impacts to historic and cultural resources:

- Amend the rules to allow American Association of State Highway and Transportation Officials and Federal Highway Administration [bridge/culvert design] standards (by name)
- Remove the culvert design standards
- Amend the bridge design standards.
- Amend the rules to use a channel forming flow, such as the 2-year flood, instead of a rare flood like the 100-year to evaluate how changes in flow velocity will affect fish life
- Delete the provision to design and locate boat ramps and launches to avoid and minimize excavation below the OHWL

4.7.5.5 Mitigation

Measures that reduce project footprint or minimize disturbance to sediments could also reduce risk of impacts to cultural resources associated with those sediments.

4.7.6 Agriculture

Agricultural production is a significant contributor to economic activity in the state of Washington, and many agriculture activities occur adjacent to rivers. The effects of agriculture on adjacent aquatic environments generally present lower long-term risk to aquatic resources than residential or commercial/industrial development. However, some agricultural practices present risk to the aquatic environment. Impacts to water quality are the primary concerns, including turbidity, temperature, and the presence of fertilizer and pesticide residue. Other impacts can include stream flow and fish passage

issues related to irrigation diversions. Water quality concerns are addressed through Ecology's CWA authority.

Hydraulic Code Rules also affect aquaculture by regulating many aspects about aquaculture infrastructure design and location. However, the proposed rule changes do not include new provisions that are specific to aquaculture.

Hydraulic projects that divert water for agricultural irrigation or stock watering purposes and that involve seasonal construction or other work do not need an annual HPA. A permit for streambank stabilization projects to protect farm and agricultural land remains in effect without need for periodic renewal if the problem causing the need for the streambank stabilization occurs on an annual or more frequent basis. The permittee must notify WDFW before commencing the construction or other work within the area covered by the permit.

Hydraulic-project-related impacts that can involve agriculture are discussed in the sections about fish, earth, water resources, and vegetation. Provisions on HPA projects relating to agriculture could affect the overall costs associated with the project and could also influence the timing of the activity relative to the applicant's agricultural production sequence.

4.7.7 Transportation:

Hydraulic projects can affect traffic circulation and hazards, and hydraulic code rules directly affect construction and maintenance of transportation facilities. Many existing highway culverts are barriers to fish passage and were installed years before we understood and recognized the needs of fish. Both private water crossings and public stream crossings and culverts are regulated by the Hydraulic Code Rules.

Other transportation effects include impacts to construction or maintenance/repair of marine terminals, marinas and docks, and impacts to dredging as it relates to maintaining shipping channels.

Fish barriers and state highways

Washington State Department of Transportation (WSDOT) is required to install and maintain all culverts, fishways, and bridges to provide unrestricted fish passage as per Washington law, RCW 77.57.030. Design of fish barrier correction is based on the latest version of the Washington Department of Fish and Wildlife's (WDFW) Water Crossing Design Guidelines manual. Through use of this design guidance and in coordination between WSDOT and WDFW, we do not expect that new highway construction at stream crossings will result in additional barriers to fish passage.

Upgrading or replacing existing barriers, however, has been a financial challenge for the state. In March, 2013, the Washington State Supreme Court issued an injunction that requires the state to significantly increase its efforts to remove state-owned culverts that block habitat for salmon and steelhead. WDFW, WSDOT, and other partners are working together to plan how to accomplish this work (WSDOT 2014).

WDFW and WSDOT have been collaborating to steadily improve the HPA permitting process for transportation projects, and have improved the administrative process. Science and technology around stream crossing design and construction have also steadily improved. The proposed rule changes represented in Alternative 2 (preferred alternative) include the most up-to-date provisions for culvert

and water crossing design. However, many still disagree on the extent to which protective provisions should be included in the proposed rule changes, and differences among the interests are reflected in proposed rule changes under Alternatives 3 and 4.

4.7.7.1 Existing conditions (Alternative 1) that affect transportation

WSDOT and WDFW are committed to fixing fish barrier culverts and have been working together since 1991 to inventory and assess barriers statewide, as well as to develop the best culvert and bridge designs to use under particular conditions.

WSDOT currently removes fish barriers associated with state-managed highways one of three ways. First, WSDOT fixes many culverts through the construction of highway mobility and safety projects. Second, WSDOT operates an Environmental Retrofit program that funds standalone fish barrier removal projects that targets correction of the highest priority culverts that would otherwise not be fixed by a highway construction project anytime in the near future. And third, some limited work on fish passage barrier correction and repair is done as part of routine road maintenance or road preservation projects (WSDOT 2014).

Existing provisions that affect transportation include rules about project location, size, sediment and vegetation impact, and construction practices. No provisions would be changed under Alternative 1.

4.7.7.2 Provisions of Alternative 2 that affect transportation

A new WAC section has additional construction provisions for job site access, equipment use, and sediment and erosion control to reduce impacts to sensitive areas and water quality. New provisions for construction materials and work area isolation reduce impacts to water quality. The new work area isolation and fish removal provisions also protect fish from entrainment, stranding, and handling.

Other provisions of Alternative 2 that affect transportation include:

Fish passage improvement projects:

- Work windows will minimize overlap of authorized work with presence of sensitive life history stages of fish.
- Design must allow for upstream and downstream passage at all flows.

Overwater structure provisions:

- More robust design requirements will minimize impacts to habitat (e.g., most excavation to occur in upland).
- Construction methods and material requirements will minimize impacts to fish and habitat (e.g., treated wood can no longer be used for decking material for docks/piers and bubble curtains must be used to minimize underwater noise during pile driving activities).
- Work windows will minimize overlap of authorized work with presence of sensitive life history stages of fish.
- Restricting facility placement outside of breeding areas will minimize potential for injury and death as well as preserving breeding habitat.
- Requiring mitigation that will adequately compensate for loss of habitat and function.

Marinas and terminals in saltwater areas:

- Requirements for facility siting will minimize impacts to sensitive life history stages and habitat (e.g., facilities to be located outside of forage fish spawning areas and in areas of low or impaired biological integrity).
- More robust design requirements will minimize impacts to habitat (e.g., marina/terminal dimensions will be reduced).
- Construction methods and material requirements will minimize impacts to fish and habitat (e.g., light penetration required via adequate grating)
- Work windows will minimize overlap of authorized work with presence of sensitive life history stages of fish.
- Requiring mitigation that will adequately compensate for loss of habitat and function

Dredging in saltwater areas:

- Methods and material requirements will minimize injury to fish and shellfish (e.g., keeping suction dredge intakes at or near bottom to prevent entrainment)
- Work windows will minimize overlap of authorized work with presence of sensitive life history stages of fish.
- Dredging in forage fish spawning areas or habitats of special concern is prohibited (e.g., no dredging allowed in herring spawning habitat).
- May require hydrodynamic modeling

4.7.7.3 Provisions of Alternative 3 that affect transportation

Provisions of Alternative 3 can affect the risk of impacts to transportation:

- Require scientific justification to prove that dredging will resolve flooding problems before any HPAs for dredging are issued.
- Require permittees to install stream simulation culverts unless the permittee can show that stream simulation is not feasible, or that another design will provide equal or better protection of fish life.
- Retain the current (Alternative 1) WDFW priorities for water crossings.
- Remove the no-slope design alternative
- Require a shorter bridge design be based on engineering constraints and not constraints caused by existing infrastructure and levee setback opportunities.
- Roughened channel would be a temporary fish passage improvement solution used only in extreme circumstances with a valid reason why a more reliable fish passage method (e.g. stream simulation or bridge) cannot be used.
- Hydraulic design option culverts would have limited application in exceptional circumstances where constraints prevent the use of bridges, no-slope, and stream simulation culverts.
- Require that conduit lines in watercourses would not constrict the channel or preclude future opportunities for bridges or other less-impacting approaches to water crossings.
- New and expanded docks, wharves, piers, marinas, rafts, shipyards, and terminals must be at least a specified buffer distance from existing native aquatic vegetation attached to or rooted in substrate.

4.7.7.4 Provisions of Alternative 4 that affect transportation

- Authorize dredging in fish spawning areas.

- Amend the rules to allow American Association of State Highway and Transportation Officials and Federal Highway Administration [bridge/culvert design] standards (by name) because they have been well vetted by the engineering community.
- Remove the culvert design standards. The designs proposed are not based on technically sound engineering practices and are not justified by significant research.
- Amend the bridge design standards because they may require the preparation of multiple designs so that the cost differential can be quantified, thus increasing the time and costs associated with all bridge projects.
- Amend the rules to use a channel forming flow, such as the 2-year flood, instead of a rare flood like the 100-year to evaluate how changes in flow velocity will affect fish life.
- The department would not require compensatory mitigation if a fish passage structure cannot pass all fish species present at all mobile life stages.

4.7.8 Public Services and Utilities

This section includes impacts to public services such as fire, police, schools, and parks, and utilities/infrastructure that deliver communications, water supply, stormwater, sewer, solid waste, electricity, and natural gas. Most hydraulic projects don't adversely impact fire, police, schools and parks outside of the effects discussed under noise, light, aesthetics, recreation, and transportation. Hydraulic Code Rules do contain provisions that regulate outfall structures, utility crossings, tide- and flood-gate structures, utility lines in aquatic environments, and boring in aquatic environments.

The purpose of Hydraulic Code Rules is to protect fish life as projects are being constructed. Provisions under the hydraulic code rules could cause design delays and cost increases for public services and utility projects.

4.7.8.1 Existing conditions (Alternative 1) that affect public services and utilities

Impacts of the Hydraulic Code Rules on public services and utilities would remain the same as under current conditions.

4.7.8.2 Provisions of Alternative 2 that affect public services and utilities

A new WAC section has additional construction provisions for job site access, equipment use, sediment and erosion control to reduce impacts to sensitive areas and water quality. New provisions for construction materials and work area isolation reduce impacts to water quality. The new work area isolation and fish removal provisions also protect fish from entrainment, stranding, and handling.

Marinas and terminals in freshwater areas:

- Require designs to avoid impacts to fish spawning areas and juvenile salmon migration corridors, rearing, and feeding areas. This reduces risk of altering the light regime and migration patterns.
- Require new facilities to avoid and minimize impacts to aquatic vegetation.
- Require facilities to be located in areas that will reduce impacts to fish life, where possible. This reduces the risk of impacts from modifying aquatic vegetation, altering migration patterns, disturbing substrate, and altering stream morphology and sediment movement and delivery.
- Pile driving provisions reduce the risk of impacts from elevated sound levels.

- New provisions for removing treated wood piling reduce risk from water quality modification.

Water diversions and intakes:

- Minimize impacts by requiring screening of all diversions to prevent fish entry.
- Minimize impacts by requiring that all upstream and downstream passage be maintained at points of diversion.

Outfalls in freshwater areas:

- Recommend use of flow spreaders in buffer area rather than outfall in stream.
- Design must prevent fish entrainment.
- More robust design requirements will minimize impacts to habitat.
- Construction methods and material requirements will minimize impacts to fish and habitat.

Utility crossings in freshwater areas:

- Recommend use of less invasive techniques such as directional drilling and punch and bore drilling below scour potential of streambed.
- Locate crossings in stable areas (no meanders, no active floodplain) minimizes risk of erosion and damage to facility.
- Locate crossings outside of spawning areas.

Outfall and tide and flood gate structures in saltwater areas:

- Location of outfalls and energy dissipaters must not cause the loss of fish/shellfish habitat.
- More robust design requirements will minimize impacts to habitat .
- Construction methods and material requirements will minimize impacts to fish and habitat.

Boring in saltwater areas:

- Require construction methods and material that minimize turbidity.
- All boreholes must be sealed following construction.

Utility lines in saltwater areas:

- Construction methods and materials must minimize impacts to aquatic life and habitat.
- Lines must be located outside of saltwater habitats of special concern (e.g., forage fish spawning habitat).
- Lines must be placed during approved work windows.

4.7.8.3 Provisions of Alternative 3 that affect public services and utilities

- A tee diffusor outfall would be the only design method authorized in low flow situations.
- Require that conduit lines in watercourses would not constrict the channel or preclude future opportunities for bridges or other less-impacting approaches to water crossings.
- All fish passage improvement structures would be temporary and a timeframe would be established in rule for a permanent solution to be implemented.

4.7.8.4 Provisions of Alternative 4 that affect public services and utilities

- Remove the limit on the number of sites covered in a multi-site HPA.

- Do not require compensatory mitigation for routine maintenance, repair, rehabilitation or replacement of the structure even if new impacts to fish life occurred as a result of the work.
- Eliminate need for HPA every 5 years for annual removal and reinstallation of docks to prevent storm and ice damage.
- Roughened channel would be a temporary fish passage improvement solution used only in extreme circumstances with a valid reason why a more reliable fish passage method (e.g. stream simulation or bridge) cannot be used.

Table 4-9 Comparison of Impacts of the Alternatives to the Built Environment

Element Impacted	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Built Environment	No change in risk	Some reductions in risk; Some increased risks	Increase in risk	Reduction in risk

4.7.9 Mitigation for impacts to the built environment

HPA application procedures have been streamlined, which will partially offset any increased design and construction time needed to comply with new rules and new work windows. Additionally, including detailed regulations in the proposed new rules instead of relying on site-by-site provisions to protect fish would help assure developers that certain uses will be allowed and will minimize the need to revise designs during the permitting process.

4.7.9.1 Mitigating Alternative 1 – No Action Alternative

The existing Hydraulic Code Rules contain provisions to protect fish life, or minimize risk of impact to fish life, during hydraulic project construction. Many of these measures also protect the built environment. New science and technology offer us new ways to minimize or avoid impacts. Under Alternative 1, no proposed rule changes would be adopted and the rules would remain inconsistent with newer science and design technology.

Under the current Hydraulic Code Rules, many protections for fish are included as site-by-site provisions for specific projects. This leads to uncertainty for applicants. Additionally, inefficient procedures for HPAs can lead to lengthy review times that delay projects. Though few uses are completely prohibited, complying with specific Hydraulic Code Rules in design and construction add time and cost to projects. Under Alternative 1, these impacts would remain the same as under existing conditions.

4.7.9.2 Mitigating Alternative 2 – WDFW-Proposed Rule Changes

The proposed changes to the Hydraulic Code Rules in Alternative 2 would increase the cost of compliance for applicants. The stricter design standards will likely increase the cost of constructing some hydraulic projects; for example, provisions for mooring buoys limit the type of materials that can be used for the buoys (WAC 220-110-150). Added Best Management Practices, new requirements for

maintenance and repair of in-water structures, and changes in work windows will also increase the cost of some projects.

Property owners could experience higher long-term costs from the Hydraulic Code Rule changes if they are not able to develop their property as expected. This is true of Alternative 1 as well, but as some areas of the proposed rule changes are stricter than the existing rules, there is a greater potential for property owners to experience higher development costs.

Overall, Alternative 2 would reduce the risk of negative impacts to the built environment, as compared to Alternative 1. This is because Preferred Alternative includes provisions that minimize impacts to the built environment during construction, and provide flexibility for project-specific conditions instead of the current one-size-fits-all approach. Changes in the type, magnitude, or distribution of effects on the built environment would be expected based on proposed provisions in Alternative 2. Future outcomes are expected to be better than those under the no-action alternative. No mitigation is offered to offset negative effects to the built environment.

4.7.9.3 Mitigating Alternative 3

Provisions of Alternative 3 generally increase the risk of impacts to the built environment. No mitigation is offered to offset these effects.

4.7.9.4 Mitigating Alternative 4

Provisions of Alternative 4 generally decrease the risk of impacts to the built environment.

4.8 Economic Issues

Social and economic issues are evaluated in detail in the separate Small Business Economic Impact Statement (SBEIS) document. RCW 19.85.030 (Agency rules – Small business economic impact statement – Reduction of costs imposed by rule) requires that an SBEIS be prepared when any rule change imposes more than minor costs on businesses in an industry. The SBEIS compares the cost of compliance for a small business with the cost of compliance for large businesses on a cost per employee, hour of labor, or one hundred dollars of sales basis. The SBEIS also includes a list of industries that will need to comply with the rule, and an estimate of the number of jobs created or lost as a result of the rule.

4.9 Cumulative Impacts

The State Environmental Policy Act (SEPA) does not define cumulative impacts; however, the National Environmental Policy Act (NEPA) defines them as “the effects that may result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions” (40 CFR 1508.7). This definition is generally accepted and used as a guideline by lead agencies to define cumulative impacts under SEPA. An impact can be considered cumulative if: a) effects of several actions occur in the same locale; b) effects on a particular resource are similar in nature; and c) effects are long-term in nature. Based on those three criteria, construction of individual hydraulic projects could result in adverse cumulative impacts to the aquatic environment. Hydraulic projects are often concentrated in

one area, the effects of many hydraulic projects are similar in nature, and they have the potential to result in long-term impacts.

Past development has significantly altered the aquatic environment throughout the State of Washington. This development is considered a major factor contributing to the decline of fish and aquatic species and their habitat. The decline of aquatic habitat conditions has been well documented, especially in the Puget Sound area. For example, the Puget Sound Nearshore Ecosystem Restoration Project documented historic changes to the shoreline and found that very few areas were unchanged and that the “vast majority of changes are due to human alterations” (Simenstad et al., 2011). While many of the alterations to the aquatic environment predate regulations, including the Hydraulic Code Rules, development in the aquatic environment is on-going. On-going and future development would exacerbate these past impacts to aquatic habitat.

WDFW has developed the proposed changes to the Hydraulic Code Rules in order to incorporate current knowledge about fish science and design technology for hydraulic projects. The improved design requirements and specific mitigation measures included in the proposed changes are intended to decrease the impacts associated with individual hydraulic projects. WDFW is also working with other agencies and entities throughout the state to restore aquatic habitat that has been affected by past development.

This Programmatic EIS evaluates the general impacts of changes to the Hydraulic Code Rules. It is the first step in a phased review of hydraulic projects. Potential impacts of individual hydraulic projects would be evaluated as they are proposed. WDFW would impose design and mitigation requirements for proposed projects to decrease potential impacts to the aquatic environment. As indicated in Chapter 4, the proposed rule changes are expected to result in improved or maintained conditions over the No Action Alternative. Examples of these regulations are new design requirements for docks, boat ramps and marinas that will reduce the impacts to habitat; new work windows that will minimize the overlap of work with species presence; and requirements for construction methods and materials will minimize impacts to fish and habitat.

In addition to the requirement that hydraulic projects meet the Hydraulic Code Rules, most hydraulic projects undergo additional environmental review and compliance with the requirements of local critical areas ordinances and Shoreline Management Programs, as well as federal requirements of Corps of Engineers Sections 10 and 404 of the Clean Water Act permitting and Section 7 consultation under the Endangered Species Act. These additional regulations may help further minimize and mitigate the impacts of individual projects.

While the improved design requirements and specific mitigation measures in the proposed Hydraulic Code Rules are intended to decrease the impacts associated with individual hydraulic projects, cumulative impacts will continue to occur as the number of projects constructed increases. Even with implementation of the revised Hydraulic Code Rules, there will continue to be shoreline modifications and other changes that will cause loss of habitat. However, it is important to note that the cumulative impacts of the new regulations will be to reduce overall habitat losses.

Chapter 5 Supplemental Programmatic EIS References

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Washington State Department of Ecology (Ecology) and the National Oceanic and Atmospheric Administration (NOAA). 2001. Managing Washington’s Coast, Washington’s Coastal Zone Management Program. Publication 00-06-029. Feb. 2001. v

Washington State Department of Transportation. 2014. WSDOT web site regarding fish passage at <http://www.wsdot.wa.gov/Environment/Biology/FP/fishpassage.htm> Accessed June 27, 2014. v

Key to SHB 2661 Categories Relating to Level of Peer Review:

Category Code	SHB 2661 Section 1(c)
i	(i) Independent peer review: Review is overseen by an independent third party
ii	(ii) Internal peer review: Review by staff internal to the department of fish and wildlife;
iii	(iii) External peer review: Review by persons that are external to and selected by the department of fish and wildlife;
iv	(iv) Open review: Documented open public review process that is not limited to invited organizations or individuals;
v	(v) Legal and policy document: Documents related to the legal framework for the significant agency action including but not limited to: (A) Federal and state statutes; (B) Court and hearings board decisions; (C) Federal and state administrative rules and regulations; and (D) Policy and regulatory documents adopted by local governments;
vi	(vi) Data from primary research, monitoring activities, or other sources, but that has not been incorporated as part of documents reviewed under the processes described in (c)(i), (ii), (iii), and (iv) of this subsection;
vii	(vii) Records of the best professional judgment of department of fish and wildlife employees or other individuals; or
viii	(viii) Other: Sources of information that do not fit into one of the categories identified in this subsection (1)(c).

Appendix A

**COMMENTS RECEIVED ON DRAFT PROGRAMMATIC ENVIRONMENTAL
IMPACT STATEMENT AND
VERSION 4 PROPOSED HPA RULES**

Appendix A Comments Received

An agency may prepare a Supplemental EIS to address new alternatives, new areas of likely significant adverse impact, or to add analysis to areas not adequately addressed in the original EIS (WAC 197-11-405(4)). A Supplemental Draft EIS does not typically include a formal response to comments that were received on the previous Draft EIS. Responses to comments received on both the Draft EIS and the Supplemental Draft EIS will be included in the Final Programmatic EIS.

Comments on September 2013 (“Version 4”) Draft HPA Rules

The Final Programmatic Environmental Impact Statement will contain comments and responses about the September 2013 (“Version 4”) Draft HPA rule changes.

Comments on Draft Programmatic EIS and WDFW Responses

The Final Programmatic Environmental Impact Statement will contain comments and responses about the draft programmatic environmental impact statement released for public review in September 2013.

Appendix B

**SPECIES LISTED UNDER THE STATE AND FEDERAL
ENDANGERED SPECIES ACTS**

Appendix B Species Listed under State or Federal ESA

Table B-1 lists the federally threatened or endangered wildlife species and those that are considered “species of concern” by WDFW, which includes those species listed as State Endangered, State Threatened, State Sensitive, or State Candidate. This table does not include those species designated as State Monitor that have no federal status.

Table B-1. Listed Wildlife Species and Species of Concern

Common Name	Scientific Name	State Status	Federal Status
Marine Mammals			
Fin whale	<i>Baleoptera physalus</i>	SE	FE
Gray whale	<i>Eschrichtius robustus</i>	SS	none
Humpback whale	<i>Megaptera novaeangliae</i>	SE	FE
Killer whale	<i>Orcinus orca</i>	SE	FE
North Pacific Right Whale	<i>Eubalaena japonica</i>	SE	FE
Pacific harbor porpoise	<i>Phocoena phocoena</i>	SC	none
Sea otter	<i>Enhydra lutris</i>	SE	FCo
Sei whale	<i>Baleoptera borealis</i>	SE	FE
Sperm whale	<i>Physeter macrocephalus</i>	SE	FE
Steller sea lion	<i>Eumetopias jubatus</i>	ST	FT
Land Mammals			
Black-tailed jackrabbit	<i>Lepus californicus</i>	SC	none
Blue whale	<i>Baleoptera musculus</i>	SE	FE
Cascade red fox	<i>Vulpes vulpes cascadenis</i>	SC	none
Columbian white-tailed deer	<i>Odocoileus virginianus leucurus</i>	SE	FE
Annual Report			
Fisher	<i>Martes pennanti</i>	SE	FC
Gray wolf	<i>Canis lupus</i>	SE	FE
Gray-tailed vole	<i>Microtus canicaudus</i>	SC	none
Grizzly bear	<i>Ursus arctos</i>	SE	FT
Keen's myotis	<i>Myotis keenii</i>	SC	none
Lynx	<i>Lynx canadensis</i>	ST	FT
Mazama (Western) pocket gopher	<i>Thomomys mazama</i>	ST	FC
Olympic marmot	<i>Marmota olympus</i>	SC	none
Preble's shrew	<i>Sorex preblei</i>	SC	FCo
Pygmy rabbit	<i>Brachylagus idahoensis</i>	SE	FE
Tacoma pocket gopher - Mazama	<i>Thomomys mazama tacomensis</i>	ST	FC
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SC	FCo
Townsend's ground squirrel	<i>Urocitellus townsendii townsendii</i>	SC	FCo
Washington ground squirrel	<i>Urocitellus washingtoni</i>	SC	FC
Western gray squirrel	<i>Sciurus griseus</i>	ST	FCo
White-tailed jackrabbit	<i>Lepus townsendii</i>	SC	none
Wolverine	<i>Gulo gulo</i>	SC	FC
Woodland caribou	<i>Rangifer tarandus</i>	SE	FE
Amphibian			
Cascade torrent salamander	<i>Rhyacotriton cascadae</i>	SC	none
Columbia spotted frog	<i>Rana luteiventris</i>	SC	none
Dunn's salamander	<i>Plethodon dunnii</i>	SC	none
Larch Mountain salamander	<i>Plethodon larselli</i>	SS	FCo
Northern leopard frog	<i>Rana pipiens</i>	SE	FCo
Oregon spotted frog	<i>Rana pretiosa</i>	SE	FC

Common Name	Scientific Name	State Status	Federal Status
Rocky Mountain Tailed Frog	<i>Ascaphus montanus</i>	SC	FCo
Van Dyke's salamander	<i>Plethodon vandykei</i>	SC	FCo
Western toad	<i>Anaxyrus boreas</i>	SC	FCo
Reptile			
California mountain kingsnake	<i>Lampropeltis zonata</i>	SC	none
Green sea turtle	<i>Chelonia mydas</i>	ST	FT
Leatherback sea turtle	<i>Dermochelys coriacea</i>	SE	FE
Loggerhead sea turtle	<i>Caretta caretta</i>	ST	FE
Sagebrush lizard	<i>Sceloporus graciosus</i>	SC	FCo
Sharptail snake	<i>Contia tenuis</i>	SC	FCo
Striped whipsnake	<i>Masticophis taeniatus</i>	SC	none
Western pond turtle	<i>Actinemys marmorata</i>	SE	FCo
Birds			
American white pelican	<i>Pelecanus erythrorhynchos</i>	SE	none
Bald eagle	<i>Haliaeetus leucocephalus</i>	SS	FCo
Black swift	<i>Cypseloides niger</i>	SM	FCo
Black-backed woodpecker	<i>Picoides arcticus</i>	SC	none
Brandt's cormorant	<i>Phalacrocorax penicillatus</i>	SC	none
Brown pelican	<i>Pelecanus occidentalis</i>	SE	FCo
Burrowing owl	<i>Athene cucularia</i>	SC	FCo
Cassin's auklet	<i>Ptychoramphus aleuticus</i>	SC	FCo
Clark's grebe	<i>Aechmophorus clarkii</i>	SC	none
Columbian Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	ST	FCo
Common loon	<i>Gavia immer</i>	SS	none
Common murre	<i>Uria aalge</i>	SC	none
Ferruginous hawk	<i>Buteo regalis</i>	ST	FCo
Flammulated owl	<i>Otus flammeolus</i>	SC	none
Golden eagle	<i>Aquila chrysaetos</i>	SC	none
Greater Sage-grouse	<i>Centrocercus urophasianus</i>	ST	FC
Lewis' woodpecker	<i>Melanerpes lewis</i>	SC	none
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	FCo
Marbled murrelet	<i>Brachyramphus marmoratus</i>	ST	FT
Northern goshawk	<i>Accipiter gentilis</i>	SC	FCo
Northern Spotted Owl	<i>Strix occidentalis</i>	SE	FT
Oregon vesper sparrow	<i>Pooecetes gramineus affinis</i>	SC	FCo
Peregrine falcon	<i>Falco peregrinus</i>	SS	FCo
Pileated woodpecker	<i>Dryocopus pileatus</i>	SC	none
Purple martin	<i>Progne subis</i>	SC	none
Sage sparrow	<i>Amphispiza belli</i>	SC	none
Sage thrasher	<i>Oreoscoptes montanus</i>	SC	none
Sandhill crane	<i>Grus canadensis</i>	SE	none
Short-tailed albatross	<i>Diomedea albatrus</i>	SC	FE
Slender-billed white-breasted nuthatch	<i>Sitta carolinensis aculeata</i>	SC	FCo
Snowy plover	<i>Charadrius nivosus</i>	SE	FT
Streaked horned lark	<i>Eremophila alpestris strigata</i>	SE	FC
Tufted puffin	<i>Fratrercula cirrhata</i>	SC	FCo
Upland sandpiper	<i>Bartramia longicauda</i>	SE	none
Vaux's swift	<i>Chaetura vauxi</i>	SC	none
Western grebe	<i>Aechmophorus occidentalis</i>	SC	none
White-headed woodpecker	<i>Picoides albolarvatus</i>	SC	none
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	SC	FC
Mollusk			

Common Name	Scientific Name	State Status	Federal Status
Bluegray Taildropper	<i>Prophysaon coeruleum</i>	SC	none
California floater	<i>Anodonta californiensis</i>	SC	FCo
Columbia oregonian	<i>Cryptomastix hendersoni</i>	SC	none
Columbia pebblesnail	<i>Fluminicola columbiana</i>	SC	FCo
Dalle's Sideband	<i>Monadenia fidelis minor</i>	SC	none
Giant Columbia River limpet	<i>Fisherola nuttalli</i>	SC	none
Northern abalone	<i>Haliotis kamtschatkana</i>	SC	FCo
Olympia oyster	<i>Ostrea lurida</i>	SC	none
Poplar oregonian	<i>Cryptomastix populi</i>	SC	none
Butterfly or Moth			
Chinquapin hairstreak	<i>Habrodais grunus herri</i>	SC	none
Great arctic	<i>Oeneis nevadensis gigas</i>	SC	FCo
Johnson's hairstreak	<i>Mitoura johnsoni</i>	SC	none
Juniper hairstreak	<i>Mitoura grynea barryi</i>	SC	none
Makah copper	<i>Lycaena mariposa charlottensis</i>	SC	FCo
Mardon skipper	<i>Polites mardon</i>	SE	FC
Oregon silverspot butterfly	<i>Speyeria zerene hippolyta</i>	SE	FT
Puget blue	<i>Plebejus icarioides blackmorei</i>	SC	none
Sand-verbena moth	<i>Copablepharon fuscum</i>	SC	none
Shepard's parnassian	<i>Parnassius clodius shepardii</i>	SC	none
Taylor's checkerspot	<i>Euphydryas editha taylori</i>	SE	FC
Valley silverspot	<i>Speyeria zerene bremnerii</i>	SC	FCo
Yuma skipper	<i>Ochlodes yuma</i>	SC	none
Other Insect			
Beller's ground beetle	<i>Agonum belleri</i>	SC	FCo
Bog idol leaf beetle	<i>Donacia idola</i>	SC	none
Columbia clubtail (dragonfly)	<i>Gomphus lynnae</i>	SC	FCo
Columbia River tiger beetle	<i>Cicindela columbica</i>	SC	none
Hatch's click beetle	<i>Eanus hatchi</i>	SC	FCo
Island Marble	<i>Euchloe ausonides</i>	SC	FCo
Mann's Mollusk-eating Ground Beetle	<i>Scaphinotus mannii</i>	SC	none
Pacific clubtail	<i>Gomphus kurilis</i>	SC	none
Silver-bordered fritillary	<i>Boloria selene atrocotalis</i>	SC	none

State Endangered (SE), State Threatened (ST), State Candidate (SC), State Sensitive (SS), State Monitor (SM)
Federal Endangered (FE), Proposed Endangered (FPE), Threatened (FT), Proposed Threatened (FPT), Candidate (FC), or Species of Concern (FSC).

Table B-2 lists the federally threatened or endangered fish species, and those that are considered “species of concern” by WDFW, which includes those species listed as State Endangered, State Threatened, State Sensitive, or State Candidate. This table also includes some species designated as State Monitor that have no federal status.

Table B-2. Listed Fish Species and Species of Concern with Status of Critical Habitat Designation

Common Name (ESU/DPS)	Scientific Name	State Status	Federal Status	Designated Critical Habitat
Bull trout	<i>Salvelinus confluentus</i>	SC	FT	Designated
Chinook salmon (Lower Columbia)	<i>Oncorhynchus tshawytscha</i>	SC	FT	Designated
Chinook salmon (Puget Sound)	<i>Oncorhynchus tshawytscha</i>	SC	FT	Designated
Chinook salmon (Snake R. Fall)	<i>Oncorhynchus tshawytscha</i>	SC	FT	Designated
Chinook salmon (Snake R. Sp/Su)	<i>Oncorhynchus tshawytscha</i>	SC	FT	Designated
Chinook salmon (Upper Columbia Sp)	<i>Oncorhynchus tshawytscha</i>	SC	FE	Designated
Chinook salmon (Upper Willamette)	<i>Oncorhynchus tshawytscha</i>	SC	FT	Designated
Chum salmon (Hood Canal Su)	<i>Oncorhynchus keta</i>	SC	FT	Designated
Chum salmon (Lower Columbia)	<i>Oncorhynchus keta</i>	SC	FT	Designated
Coho salmon (Lower Columbia)	<i>Oncorhynchus kisutch</i>	none	FT	Proposed
Coastal cutthroat trout (SW WA)	<i>Oncorhynchus clarki clarki</i>	none	Fco	none
Sockeye salmon (Ozette Lake)	<i>Oncorhynchus nerka</i>	SC	FT	Designated
Sockeye salmon (Snake R.)	<i>Oncorhynchus nerka</i>	SC	FE	Designated
Steelhead (Lower Columbia)	<i>Oncorhynchus mykiss</i>	SC	FT	Designated
Steelhead (Middle Columbia)	<i>Oncorhynchus mykiss</i>	SC	FT	Designated
Steelhead (Puget Sound)	<i>Oncorhynchus mykiss</i>	none	FT	Proposed
Steelhead (Snake River)	<i>Oncorhynchus mykiss</i>	SC	FT	Designated
Steelhead (Upper Columbia)	<i>Oncorhynchus mykiss</i>	SC	FT	Designated
Steelhead (Upper Willamette)	<i>Oncorhynchus mykiss</i>	SC	FT	Designated
Black rockfish	<i>Sebastes melanops</i>	SC	none	none
Bocaccio rockfish	<i>Sebastes paucispinis</i>	SC	FE	none
Brown rockfish	<i>Sebastes auriculatus</i>	SC	FCo	none
Boraccio rockfish	<i>Sebastes paucispinis</i>		FE	Proposed
Canary rockfish	<i>Sebastes pinniger</i>	SC	FT	Proposed
China rockfish	<i>Sebastes nebulosus</i>	SC	none	none
Copper rockfish	<i>Sebastes caurinus</i>	SC	FCo	none
Eulachon	<i>Thaleichthys pacificus</i>	SC	FT	Designated
Green sturgeon	<i>Acipenser medirostris</i>	none	FT	Designated
Greenstriped rockfish	<i>Sebastes elongatus</i>	SC	none	none
Kokanee (Lk Sammamish)	<i>Oncorhynchus nerka</i>	none	FC	none
Lake chub	<i>Couesius plumbeus</i>	SC	none	none
Leopard dace	<i>Rhinichthys falcatus</i>	SC	none	none
Margined sculpin	<i>Cottus marginatus</i>	SS	FCo	none
Mountain sucker	<i>Catostomus platyrhynchus</i>	SC	none	none
Olympic mudminnow	<i>Novumbra hubbsi</i>	SS	none	none
Pacific cod (S&C Puget Sound)	<i>Gadus macrocephalus</i>	SC	FCo	none
Pacific hake (Pacific-Georgia Basin DPS)	<i>Merluccius productus</i>	SC	FCo	none
Pacific herring	<i>Clupea pallasii</i>	SC	FCo	none
Pacific Lamprey	<i>Entosphenus tridentatus</i>	SM	FCo	none
Paiute sculpin	<i>Cottus beldingi</i>	SM	none	none
Pygmy whitefish	<i>Prosopium coulteri</i>	SS	FCo	none
Quillback rockfish	<i>Sebastes maliger</i>	SC	FCo	none
Redstripe rockfish	<i>Sebastes proriger</i>	SC	none	none
Reticulate sculpin	<i>Cottus perplexus</i>	SM	none	none

Common Name (ESU/DPS)	Scientific Name	State Status	Federal Status	Designated Critical Habitat
River lamprey	<i>Lampetra ayresi</i>	SC	FCo	none
Salish sucker	<i>Catostomus catostomas</i>	SM	none	none
Sand roller	<i>Percopsis transmontana</i>	SM	none	none
Slimy sculpin	<i>Cottus cognatus</i>	SM	none	none
Tiger rockfish	<i>Sebastes nigrocinctus</i>	SC	none	none
Umatilla dace	<i>Rhinichthys umatilla</i>	SC	none	none
Walleye pollock (So. Puget Sound)	<i>Theragra chalcogramma</i>	SC	FCo	none
Widow rockfish	<i>Sebastes entomelas</i>	SC	none	none
Yelloweye rockfish	<i>Sebastes ruberrimus</i>	SC	FT	Proposed
Yellowtail rockfish	<i>Sebastes flavidus</i>	SC	none	none

State Endangered (SE), State Threatened (ST), State Candidate (SC), State Sensitive (SS), State Monitor (SM)
 Federal Endangered (FE), Proposed Endangered (FPE), Threatened (FT), Proposed Threatened (FPT), Candidate (FC), or Species of Concern (FSC).