

# Hydraulic Code Rulemaking (Chapter 220.660 WAC)- Cost/Benefit Analysis & Small Business Economic Impact Statement

E113007600



## Document Information

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Project Number        E113007600  
Project Manager       Susan Burke  
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Prepared for:  
Washington State Department of Fish and Wildlife  
Randi Thurston  
Natural Resources Building  
1111 Washington St. SE  
Olympia, WA 98501

Prepared by:



Cardno ENTRIX  
801 2nd Avenue  
Suite 700  
Seattle, WA 98104 USA

# Table of Contents

**Executive Summary .....i**

**1 Background and Scope .....1-1**

1.1 How the Project Started ..... 1-1

1.2 The HPA Rule-Making Process..... 1-1

1.3 Public participation and review of proposed rules..... 1-1

1.4 Cost Benefit Analysis and Small Business Economic Impact Statement ..... 1-2

**2 Proposed Action and Baseline.....2-1**

2.1 Changes under the proposed rules ..... 2-1

2.2 Baseline ..... 2-1

2.2.1 Federal Regulations ..... 2-1

2.2.2 Washington State..... 2-12

2.2.3 Summary Baseline ..... 2-17

**3 Data Profile, Methods and Results.....3-1**

3.1 Who Applies for HPAs? ..... 3-2

3.2 How many HPAs could be Subject to the Proposed Rule Changes? ..... 3-3

3.3 Cost Analysis..... 3-6

3.4 Benefits Included in the Analysis..... 3-12

**4 Small Business Economic Impact Statement.....4-1**

**5 References and Resources.....5-1**

## Appendices

Appendix A Appendix A.... Analysis of Eight Federally-Funded, County-Owned Bridges in Washington

## Tables

Table 1. Summary of Baseline Data ..... 2-18

Table 2. Number of HPAs issued per year, 2008-2012, all projects, all applicants, excluding forestry. .... 3-2

Table 3. Total HPAs by Applicant Group, 2008 - 2012..... 3-2

Table 4. Estimate of the Average Annual Percent of Total HPAs by Proposed Rules, 2008-2013..... 3-3

Table 5. Estimated Five-Year Average Annual Number of HPAs by Rule and Applicant Group, Ordered by Volume, 2008-2012..... 3-5

Table 6. Assumptions for Cost Savings from the General Hydraulic Project Approval. .... 3-7

Table 7. Quantified and Qualified Estimated Costs of Implementing Proposed Rule Changes..... 3-10

## Acronyms

CBA	Cost Benefit Analysis
CCA	Copper chrome arsenic
ACZA	Ammonical copper zinc arsenate
ACQ	Ammonical copper quaternary
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DNR	Washington State Department of Natural Resources
ECY	Washington Department of Ecology
FHWA	Federal Highway Administration
FWS	U. S. Fish and Wildlife Service
HEC	Hydrologic Engineering Center, U.S. Army Corps of Engineers
HPA	Hydraulic Project Approval
MEA	Millenium ecosystem Assessment
NMFS	National Marine Fisheries Service
NRC	National Research Council
NWP	Nationwide Permit, U.S. Army Corps of Engineers
PEIS	Draft Programmatic Environmental Impact Statement
RCW	Revised Code of Washington
SBEIS	Small Business Economic Impact Statement
SMA	Shoreline Management Act
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington Department of Transportation

## Executive Summary

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The Hydraulic Code Rules, except those for mineral prospecting, were last updated in 1994. The proposed rule changes will update the requirements and make them consistent with statutory, procedural, and administrative changes and current fish science and design technology. 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 structure for adaptive management in response to changing science and technology and/or the results of compliance and effectiveness monitoring.

This report presents the findings of both the Cost Benefit Analysis (CBA), as directed under RCW 34.05.325, and the Small Business Economic Impact Statement (SBEIS), as directed under RCW 19.85.040 of adopting the proposed rule changes.

### Costs and Benefits

**The estimated annual costs of the proposed rules changes, for those that could be quantified, ranges between \$290 thousand to \$3.6 million.** Despite the number of proposed rule changes the estimated cost of adopting the rule changes is not as large as might have been expected.

Many of the proposed rule changes are consistent with or less restrictive than existing federal (e.g. U.S. Army Corps of Engineers and National Marine Fisheries Services) and State (Shoreline Management Act) regulations. Additionally the recent United States Western District of Washington ruling, *United States of America v. State of Washington* – No. C70 – 9213, requires state agencies to comply with some of the proposed rule changes.

The CBA focuses only on those sections of the proposed rule changes that are *not attributable* to these other existing regulation or court ruling. Further, cost estimation, even when project specifications are known, is frequently plagued with uncertainties. In estimating costs for this analysis the project specifications are not known, creating a higher degree of uncertainty. Notwithstanding this uncertainty the costs and/or savings of the proposed rule changes were quantified where possible and qualified if not possible.

The estimated annual benefits of the proposed rule changes were qualified rather than quantified. Quantifying benefits would have necessitated an estimate of the avoided fish losses, which was not done. However, several other recently completed studies have quantified benefits of both 1) avoided fish loss and 2) the broader ecosystem services created when preserving fish habitat.

The recent ECY analysis of the Water Resources Management program for the Dungeness Portion of the Elwha-Dungeness Water Resources Inventory Area 18 **estimated the annual benefit of avoided fish loss ranges between \$3.8 million and \$6.8 million (ECY 2012).** Broadening the type of ecosystem goods and service benefits, beyond avoided fish loss, a recently completed report entitled *Valuing the Puget Sound Basin, Revealing Our Best Investments* estimates the value of **fourteen goods and services provided by nature within the Puget Sound Basin. The benefits range between \$9.7 billion and \$83.0 billion** (Batker et.al. 2010)

### Small Business Economic Analysis

The Regulatory Fairness Act, in RCW 19.85.040, directs that

*To determine whether the proposed rule will have a disproportionate cost impact on small businesses, the impact statement must compare the cost of compliance for small business with the cost of compliance for the ten percent of businesses that are the largest businesses required to comply with the proposed rules ...*

In RCW 19.85.020 (3) "Small business" is defined as

*... any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, and that has fifty or fewer employees.*

None of the proposed rule changes would have a disproportionate cost impact on small businesses.

# 1 Background and Scope

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## 1.1 How the Project Started

The Hydraulic Code Rules, except those for mineral prospecting, were last updated in 1994. The proposed rule changes will update the requirements and make them consistent with statutory, procedural, and administrative changes and current fish science and design technology. 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 structure for adaptive management in response to changing science and technology and/or the results of compliance and effectiveness monitoring.

## 1.2 The HPA Rule-Making Process

The Washington Department of Fish and Wildlife (WDFW) issued the Draft Programmatic Environmental Impact Statement (PEIS) on the hydraulic code rule (Chapter 220-660) Washington Administrative Code (WAC) changes in October 2013. The Draft PEIS for the Hydraulic Code Rule changes can be viewed online at <http://wdfw.wa.gov/licensing/hpa/rulemaking/> or on WDFW's Final 2013 SEPA documents webpage. WDFW received numerous thoughtful public comments on the DPEIS during the public comment period that ended December 13, 2013. The 2014 Washington State Legislature passed amendments to Revised Code of Washington (RCW) 34.05.271 that clarify 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 has determined it will prepare a Supplemental Draft PEIS on the proposed rule changes

WDFW reviewed the comments received on the October 2014 Draft PEIS and draft Hydraulic Code Rules. WDFW incorporated the necessary changes into the Supplemental Draft PEIS and proposed Hydraulic Code Rules. These documents will be sent to the Fish and Wildlife Commission in July 2014 along with this cost-benefit analysis and a Small Business Economic Impact Statement (SBEIS) as part of the official rule adoption process. WDFW will review and respond to all of the comments received during the adoption process in the Final Programmatic EIS and incorporate necessary changes into the proposed Hydraulic Code Rules.

## 1.3 Public participation and review of proposed rules

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 the summer 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.

#### **1.4 Cost Benefit Analysis and Small Business Economic Impact Statement**

Prior to adopting a rule the Revised Code of Washington (RCW) 34.05.325 directs an agency to:

*Determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented...*

In addition the Regulatory Fairness Act, in RCW 19.85.040, directs that

*To determine whether the proposed rule will have a disproportionate cost impact on small businesses, the impact statement must compare the cost of compliance for small business with the cost of compliance for the ten percent of businesses that are the largest businesses required to comply with the proposed rules ...*

In RCW 19.85.020 (3) "Small business" is defined as

*... any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, and that has fifty or fewer employees.*

This report presents the findings of both the Cost Benefit Analysis (CBA), as directed under RCW 34.05.325, and the Small Business Economic Impact Statement (SBEIS), as directed under RCW 19.85.040.



## 2 Proposed Action and Baseline

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### 2.1 Changes under the proposed rules

The proposed rule changes will update the requirements and make them consistent with statutory, procedural, and administrative changes and current fish science and design technology. 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 in response to changing science and technology and/or the results of effectiveness monitoring.

### 2.2 Baseline

Defining the baseline, against which to measure potential impacts of the proposed changes to the Hydraulic Code Rules, is not as simple as comparing the existing rules, last updated in 1994, to the proposed changes. Other federal and state regulatory authorities and judicial decisions dictate the design, construction and maintenance of projects located in waters of the state. If a permittee is required to follow other, existing, rule(s), regulation(s) and (standards) that are the same or more stringent, than those proposed by WDFW, then the economic impact *attributable* to WDFW's proposed rule change would be minimized, or even eliminated. For instance, comparing a road culvert designed according to the change proposed to Chapter 220-660-190 WAC, Water Crossing Structures, to an existing culvert size might increase the cost of the design and/or construction of the culvert, but the existing culvert does not satisfy the fish passage required National Marine Fisheries Service Anadromous Salmonid Passage Facility Design (see Section 2.2.1.1, below). Therefore to assign the costs of the proposed rule changes in Chapter 220-660-190 WAC would overstate the impact of the proposed rule change.

What follows is a listing of other regulations, or the regulatory backdrop, that may overlap with the changes proposed to Chapter 220-660. Included in the listing are exemptions from those other existing, rule(s), regulation(s) and (standards).

#### 2.2.1 Federal Regulations

##### 2.2.1.1 *National Marine Fisheries Service*

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) is charged by Congress to manage, conserve, and protect living marine resources within the United States Exclusive Economic Zone. NMFS also plays a supportive and advisory role in the management of living marine resources in areas under state jurisdiction. Among these living marine resources are the Pacific anadromous salmonids (salmon and steelhead) which have tremendous economic, cultural, recreational, and symbolic importance to the Pacific Northwest (NRC 1996).

As part of NMFS's management it provides criteria for culverts and bridges for waters with endangered species (NMFS, 2011). Ecological connectivity and stream simulation provide the basis of design in a manner similar to the proposed rule change. NMFS Stream simulation culvert span criteria (1.3 times bankfull width) forms a baseline for structure cost; the "embedded pipe" design method is equivalent to the "no-slope" method in proposed Chapter 220-660-190(6)(b) WAC; a preference is expressed for crossings that span (page 68)

*the stream flood plain, providing long-term dynamic channel stability, retention of existing spawning areas, maintenance of food (benthic invertebrate) production, and minimized risk of failure.*

Given that the NMFS guidelines are equivalent to the proposed rule change under Chapter 220-660-190(6)(b) WAC it is assumed that there is no economic impact of this proposed rule change in cases where a proposed culvert or bridge project spans water with endangered species and where the permittee is not exempt from NMFS rules.

### **2.2.1.2 U.S. Fish and Wildlife Service**

The Washington Fish and Wildlife Office, U. S. Fish and Wildlife Service (FWS) publish protocols and standards for fish exclusion, capture, handling, and relocation. Electroshocking guidelines and references are also included in this document. It is assumed there is no economic impact in cases where projects are meeting these protocols and standards. The proposed Chapter 220-660-120 WAC is consistent with and/or less restrictive than the protocol and standards.

### **2.2.1.3 U.S. Department of Transportation Federal Highway Administration**

Federal Highway Administration (FHWA) engineering guidelines are used by those entities receiving federal highway funding for their water crossing projects. FHWA guidelines HEC-18 (Evaluating Scour at Bridges), HEC- 20 (Stream Stability at Highway Structures), and HDS-6 (Highways in the River Environment) were written for a national audience and do not contain specific protections for fishlife. They do, on the other hand, recommend capacity and clearance criteria similar to the proposed rule change to Chapter 220-660-190(4)(a) and (f); and a recognition of geomorphic factors in crossing design in keeping with provisions of proposed rule change to Chapter 220-660-190 (4)(b), (c), and (d).

HEC 26 (Culvert Design for Aquatic Organism Passage) promotes a biological and geomorphic basis for design similar to the basis described in proposed rule change to Chapter 220-660-190 (3)(a) and (b). The culvert design methods explored in HEC 26 (a hydraulic method) would result in a culvert that is smaller than one designed using NMFS or WDFW guidelines.

Given the overlap between the proposed rule changes to Chapter 220-660-190 (4)(a)thru(d) and (f) and to Chapter 220-660-190 (3)(a) and (b) it is assumed that there is no economic impact of this proposed rule change in cases where the permittee receives funding from the FHWA.

### **2.2.1.4 U.S. Army Corps of Engineers**

The following U.S. Army Corps of Engineers (Corps) regulations overlap with some of the proposed changes to the hydraulic rule codes.

#### **2.2.1.4.1 Nationwide Permits in Washington State**

Pursuant to Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act, the Corps, is responsible for administering a Regulatory Program that requires permits for certain activities in waters of the United States. Under Section 404, the Corps regulates the discharge of dredged or fill material into waters of the United States. Under Section 10, the Corps regulates structures and/or work in or affecting the course, condition, or capacity of navigable waters of the United States.

Activities requiring Corps authorization that are similar in nature and have minimal individual and cumulative environmental impacts may qualify for authorization by a general permit, such as a nationwide permit. On February 21, 2012, the Corps issued 50 nationwide permits (the "2012 NWP"). On March 18, 2012, the Seattle District issued regional conditions for the 2012 NWP (Corps, 2012).

Many of the conditions in the 2012 NWP dictate the same or similar requirements as many of WDFW's proposed rule changes. The list below identifies the proposed rule change and the corresponding Corps conditions that are similar or the same, such that there would be no costs attributed to implementing the

proposed rule changes. Exceptions would be when a 404 permit is not required, or the permittee is exempt. Exemptions are granted to certain discharges associated with normal farming, silviculture, and ranching activities, such that costs of implementing the proposed rule change for farming and ranching activities would be attributed to the proposed rule changes.

**Proposed Chapter 220-660-080, Mitigation provisions for hydraulic projects.** The proposed change to the rules is needed to implement new statutes and policies and clarifies when WDFW may require compensatory mitigation and establishes the baseline for measuring impacts as the existing habitat condition. The proposed change dictates similar or the same requirements as listed in the following Corps NWPs:

- NWP Specific Terms and Condition number 31, Maintenance of Existing Flood Control Facilities states (page 48):
  - *Mitigation: The district engineer will determine any required mitigation one-time only for impacts associated with maintenance work at the same time that the maintenance baseline is approved. Such one-time mitigation will be required when necessary to ensure that adverse environmental impacts are no more than minimal, both individually and cumulatively.*
- National General NWP Condition number 23, Mitigation, includes the following statement (page 81):
  - *Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:*
    - *(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).*
    - *(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.*
    - *(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this requirement.*

**Proposed Chapter 220-660-120, Common construction provisions.** The proposed rule change combines the common construction requirements that apply to many types of hydraulic projects into a single section. The construction requirements are consistent with the requirements described by the Corps' NWP conditions, the names of which adequately describe their purposes:

- National General NWP Condition number 8, Adverse Effects from Impoundments
- National General NWP Condition number 9, Management of Water Flows
- National General NWP Condition number 11, Equipment
- National General NWP Condition number 14, Proper Maintenance.
- NWP Specific Terms and Conditions number 16 Return water Return Water from Upland Contained Disposal Areas...

- NWP Specific Terms and Conditions number 25 Structural Discharges
- NWP Specific Terms and Conditions number 33 Temporary Construction, Access, and Dewatering

**Proposed Chapter 220-660-110, Authorized work times in freshwater areas.** The proposed rule change provides work times for all project types. The proposed language is functionally equivalent, or less restrictive, than the requirements of the following NWP conditions.

- National General NWP Condition 3, Spawning Areas states:

*Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.*

**Proposed Chapter 220-660-130, Streambank protection and lake shoreline stabilization.** There are several common bank protection techniques for which there are currently no rules. The rationale for selecting a proposed technique ensures the appropriate lake or streambank treatment is selected based on site conditions, reach conditions and habitat impacts. The proposed language is functionally equivalent, or less restrictive, than the requirements of the following Corps NWP conditions.

- National General NWP Conditions number 4, Migratory Bird Breeding Areas states (page 77):  
*Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.*
- NWP Specific Terms and Conditions number 13, Bank Stabilization, provides a relatively long list of requirements, including the following, which summarizes a portion of the proposed change to Chapter 220-660-130 (page 27):  
*No material is placed in excess of the minimum needed for erosion protection*
- Seattle District Regional General Condition number 3. New Bank Stabilization Prohibition Areas in Tidal Waters of Puget Sound states: (page 10).  
*Activities involving new bank stabilization in tidal waters in Water Resource Inventory Areas 8, 9, 10, 11, and 12 (within the specific area identified on Figure 2) cannot be authorized by a NWP.*
- Seattle District Regional General Condition number 4. Bank Stabilization provides a relatively long list of requirements, including the following, which is functionally equivalent to the proposed change to Chapter 220-660-130 (page 27):  
*Demonstrate the proposed project incorporates the least environmentally damaging practicable bank protection methods. These methods include, but are not limited to, the use of bioengineering, biotechnical design, root wads, large woody material, native plantings, and beach nourishment in certain circumstances.*

**Proposed Chapter 220-660-140, Residential and public recreational docks, piers, ramps, floats,, watercraft lifts, and buoys in freshwater areas.** The proposed rule change provides consistent and predictable rules for pile design, steel impact driving sound attenuation, watercraft lift design, mooring buoy design and residential and public recreational dock, pier, ramp, float, watercraft lift and buoy construction projects in freshwater areas.

- NWP Specific Terms and Conditions number 10, Mooring Buoys lists requirements of both Corps and other agencies (*in SMALL CAPS*) as follows (page 22):  
*To minimize impacts and to expedite Endangered Species Act review, we recommend applicants complete and follow the terms and conditions detailed in the PROGRAMMATIC CONSULTATION*

*SPECIFIC PROJECT INFORMATION FORM FOR MOORING BUOYS LOCATED ON SEATTLE DISTRICT'S WEB PAGE, WWW.NWS.USACE.ARMY.MIL (SELECT REGULATORY/PERMITS, THEN PERMIT GUIDEBOOK, ENDANGERED SPECIES). This includes the completion and submittal of a survey of submerged aquatic vegetation (e.g., kelp and eelgrass). The appropriate survey protocols must be undertaken. These protocols can be found at the WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE WEBSITE. In addition, the CORPS' PROGRAMMATIC ESA protocols require surveying a larger area encompassing 25 feet plus the length of the moored vessels from vegetated shallows.*

*WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES has specific guidance for installation of mooring buoys on state-owned aquatic lands entitled How Do I Authorize My Mooring Buoy? at: [http://www.dnr.wa.gov/recreationeducation/howto/homeowners/pages/aqr\\_mooring\\_buoy.aspx](http://www.dnr.wa.gov/recreationeducation/howto/homeowners/pages/aqr_mooring_buoy.aspx).*

- NWP Specific Terms and Conditions number 11, Temporary Recreational Structures.

**Proposed Chapter 220-660-150, Boat ramps and launches in freshwater areas.** The proposed rule change provides consistent and predictable rules for pile design, steel impact driving sound attenuation, watercraft lift design, mooring buoy design and residential and public recreational dock, pier, ramp, float, watercraft lift and buoy construction projects in freshwater areas. The proposed rules are similar to the follow Corps NWP conditions.

- NWP Specific Terms and Conditions number 36, Boat Ramps, lists requirements for construction that are similar to the proposed rules and lists the following with respect to siting (page 55):

*Applicants should site boat ramps to avoid impacting native woody riparian vegetation, special aquatic sites (e.g., wetlands mudflats, vegetated shallows, and riffle and pool complexes) and submerged aquatic vegetation when possible*

**Proposed Chapter 220-660-160, Marinas and terminals in freshwater areas.** The proposed rule change provides consistent and predictable rules for marina and terminal construction projects in freshwater areas. The proposed rules are similar or less restrictive for existing marinas than to the following Corps NWP conditions.

- NWP Specific Terms and Conditions number 28, Modifications of Existing Marinas, states (page 45):

*Reconfiguration of existing docking facilities within an authorized marina area. No dredging, additional slips, dock spaces, or expansion of any kind within waters of the United States is authorized by this NWP*

- NWP Specific Terms and Conditions number 35, Maintenance Dredging of Existing Basins, states (page 53):

*Excavation and removal of accumulated sediment for maintenance of existing marina basins, access channels to marinas or boat slips, and boat slips to previously authorized depths or controlling depths for ingress/egress, whichever is less, provided the dredged material is deposited at an area that has no waters of the United States site and proper siltation controls are used.*

**Proposed Chapter 220-660-190, Water Crossing Structures.** The proposed rule generally describes design criteria that will achieve the following; provide unimpeded passage for all species of adult and juvenile fishes and maintain the physical characteristics of a natural stream channel throughout the water crossing.

As will be seen in Section 3, Data Profiles, Methods and Results, water-crossing projects comprise the majority of the types of projects for which HPAs are issued. Approximately 32.0 percent of all HPAs issued from 2008 through 2012 included provisions for a water crossing structures. As such the assumption that proposed change to section 220-660-190 is no more restrictive than the following Corps

NWP conditions (and other federal requirements) was analyzed in detail (see Attachment 1)-). The analysis examined eight federally-funded bridges, designed and built under existing rules, to determine if the design would comply with the proposed change to Chapter 220-660-190 WAC. In summary, seven of the eight bridges would comply. In the case were the bridge design did not comply WDFW would ask the applicant to determine if there would be measurable impacts (coarsened or scoured bed, upstream or downstream effects, and lateral constraint) from the rip rap abutments which limit lateral movement.

Despite the fact that one in eight of the bridge designs would have required additional information before an HPA was issued, the assumption that the proposed change to section 220-660-190 is no more restrictive than other federal guidelines, specifically the Corps NWP conditions, was determined to be reasonable and within a range of uncertainty regarding potential impacts of the proposed rule changes.

The proposed rule changes to Chapter 220-660-190 WAC are no more restrictive than the following Corps NWP conditions

- Seattle District Regional General Condition number 5 Crossings of Water of the U.S. (page 11).  
*Note 1 If stream simulation design method is not used to design the proposed watercourse crossing, the application must include justification for utilizing a different method. The stream simulation design method can be found in the "Fish Passage Technical Assistance Design of Road Culverts for Fish Passage" which can be found at WDFW's website.*
- National General NWP Condition number 2, Aquatic Life Movements states (page 77):  
*No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.*
- National General NWP Condition number 5, Shellfish Beds states (page 77):  
*No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity or is a shellfish seeding or habitat restoration activity.*
- National General NWP Condition number 9, Management of Water Flows. States (page 77):  
*To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities.... The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course; condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).*
- Seattle District Regional General Condition number 4, Bank Stabilization, states (page 10):  
*Each notification must ... Demonstrate the proposed project incorporates the least environmentally damaging practicable bank protection methods.*
- Seattle District Regional General Condition number 5, Crossings of Waters of the United States **states** (page11):  
*If stream simulation design method is not used to design the proposed watercourse crossing, the PCN [Pre-Construction Notification] must include justification for utilizing a different method.*

The Guide then refers the applicant to the WDFW Water Crossing Design Guidelines (WDFW 2013) for more information on culvert design.

- NWP Specific Terms and Conditions number 15, Coast Guard Approved Bridges, states:

*If the proposed activity involves bank stabilization work, you must meet the requirements of Seattle District Regional General Conditions 3 and 4 for bank stabilization.*

**Proposed Chapter 220-660-200, Fish passage improvement structures.** The primary goal of the proposed rule change is to remove fish passage barriers and to ensure unimpeded passage of fish at all life stages, as well as to maintain natural channel processes and function. The proposed language is no more restrictive than the following Corps NWP conditions:

- National General NWP Condition number 2, Aquatic Life Movements states (page 77):

*No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.*

- National General NWP Condition number 14, Linear Transportation Projects (page 29):

*For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.*

**Proposed Chapter 220-660-260, Outfall structures in freshwater areas.** The primary goal of the proposed rule change is to construct energy dissipation structures at the landward side of buffers, to cause discharged water to infiltrate into the soil of the buffer or to sheet flow through the buffer into the stream, and to prevent the entry of adult or juvenile fish and use bioengineering methods or other department approved methods to prevent scouring. The proposed language is no more restrictive than the following Corps NWP conditions:

- Seattle District Regional General Condition number 3. New Bank Stabilization Prohibition Areas in Tidal Waters of Puget Sound states: (page 10).

*Activities involving new bank stabilization in tidal waters in Water Resource Inventory Areas 8, 9, 10, 11, and 12 (within the specific area identified on Figure 2) cannot be authorized by a NWP.*

- Seattle District Regional General Condition number 4. Bank Stabilization provides a relatively long list of requirements, including the following, which is functionally equivalent to the proposed change to Chapter 220-660-260 (page 27):

*Demonstrate the proposed project incorporates the least environmentally damaging practicable bank protection methods. These methods include, but are not limited to, the use of bioengineering, biotechnical design, root wads, large woody material, native plantings, and beach nourishment in certain circumstances.*

- National General NWP Condition number 43, Stormwater Management Facilities (page 63) states:

*The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds the district engineer waives the 300 linear foot limit by making a written determination concluding that the discharge will result in minimal adverse effects.*

**Proposed Chapter 220-660-270, Utility crossings in freshwater areas.** The primary goal of the proposed rule change is to encourage trenchless crossing methods that cause very little disturbance to the streambed and banks such as high-pressure directional drilling or punch and bore crossings. Should that not be possible then the proposed language provides design requirements that will minimize impacts to waterways. The proposed language is no more restrictive than the following Corps NWP conditions:

- National General NWP Condition number 12, Utility Line Activities (page 24) states:

*The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds the district engineer waives the 300 linear foot limit by making a written determination concluding that the discharge will result in minimal adverse effects.*

**Proposed Chapter 220-660-350, Seagrass and macroalgae habitat surveys.** The proposed rule change requires surveys for seagrass and macroalgae habitat to ensure protection of these important habitats. The proposed language is no more restrictive than the following Corps NWP conditions:

- Nationwide permit specific terms and conditions number 10, Mooring Buoys (page 22) states:

*NOTE 2: To minimize impacts and to expedite Endangered Species Act review, we recommend ... completion and submittal of a survey of submerged aquatic vegetation (e.g., kelp and eelgrass). ... In addition, the Corps' programmatic ESA protocols require surveying a larger area encompassing 25 feet plus the length of the moored vessels from vegetated shallows.*

**Proposed Chapter 220-660-360, Bank protection in saltwater areas.** The proposed rule change specifies design criteria for bulkheads and other bank protection projects that will protect the beaches where spawning, mitigation, feeding and rearing occur and the nearshore ecosystem processes that form and maintain fish habitat. The proposed language is no more restrictive than the following Corps NWP conditions:

- National General NWP Conditions number 4, Migratory Bird Breeding Areas states (page 77):

*Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.*

- NWP Specific Terms and Conditions number 13, Bank Stabilization, provides a relatively long list of requirements, including the following, which summarizes a portion of the proposed change to Chapter 220-660-360 (page 27):

*No material is placed in excess of the minimum needed for erosion protection*

- Seattle District Regional General Condition number 3. New Bank Stabilization Prohibition Areas in Tidal Waters of Puget Sound states: (page 10).

*Activities involving new bank stabilization in tidal waters in Water Resource Inventory Areas 8, 9, 10, 11, and 12 (within the specific area identified on Figure 2) cannot be authorized by a NWP.*

- Seattle District Regional General Condition number 4. Bank Stabilization provides a relatively long list of requirements, including the following, which is functionally equivalent to the proposed change to Chapter 220-660-130 (page 27):

*Demonstrate the proposed project incorporates the least environmentally damaging practicable bank protection methods. These methods include, but are not limited to, the use of bioengineering, biotechnical design, root wads, large woody material, native plantings, and beach nourishment in certain circumstances.*

**Proposed Chapter 220-660-380, Boat ramps and launches in saltwater areas.** The proposed rule change specifies several design and maintenance criteria that reduce the disturbance or direct removal of



aquatic vegetation. The proposed language is no more restrictive than the following Corps NWP conditions:

- NWP Specific Terms and Conditions number 36, Boat Ramps, lists requirements for construction that are similar to the proposed rules and lists the following with respect to siting (page 55):

*Applicants should site boat ramps to avoid impacting native woody riparian vegetation, special aquatic sites (e.g., wetlands mudflats, vegetated shallows, and riffle and pool complexes) and submerged aquatic vegetation when possible*

**Proposed Chapter 220-660-390, Marinas and terminals in saltwater areas.** The proposed rule change specifies several design and maintenance criteria that reduce the impacts marinas and terminals can have on the physical processes that create or maintain fish habitat such as; the light regime, hydrology, substrate conditions, and water quality.. The proposed language is no more restrictive than the following Corps NWP conditions:

- NWP Specific Terms and Conditions number 35, Maintenance Dredging of Existing Basins, states (page 53):

*Excavation and removal of accumulated sediment for maintenance of existing marina basins, access channels to marinas or boat slips, and boat slips to previously authorized depths or controlling depths for ingress/egress, whichever is less, provided the dredged material is deposited at an area that has no waters of the United States site and proper siltation controls are used.*

**Proposed Chapter 220-660-420, Outfall and tide and flood gate structures in saltwater areas.** The proposed rule change reflects current fish science and technology measures to avoid or minimize adverse modifications to fish and shellfish habitat from outfall and tide gate structures. The proposed language is no more restrictive than the following Corps NWP conditions:

- Seattle District Regional General Condition number 4. Bank Stabilization provides a relatively long list of requirements, including the following, which is functionally equivalent to the proposed change to Chapter 220-660-420 (page 27):

*Demonstrate the proposed project incorporates the least environmentally damaging practicable bank protection methods. These methods include, but are not limited to, the use of bioengineering, biotechnical design, root wads, large woody material, native plantings, and beach nourishment in certain circumstances.*

- NWP Specific Terms and Conditions number 7, Outfall Structures and Associated Intake Structures.
- National General NWP Condition number 43, Stormwater Management Facilities

**Proposed Chapter 220-660-430, Utility crossings in saltwater areas.** The proposed rule change describes design and construction methods to avoid or minimize trenching through banks and the beach which alters habitat and substrate characteristics and hence their productivity. The proposed language is no more restrictive than the following Corps NWP conditions as it applies to the appropriate geographic and/or user:

- NWP Specific Terms and Conditions number 12, Utility Line Activities
- National General NWP Condition number 22. Designated Critical Resource Waters

**Proposed Chapter 220-660-440, Boring.** The proposed rule change reflects current fish science and technology measures to avoid or minimize adverse modifications to fish and shellfish habitat from boring activities. The proposed language is no more restrictive than the following Corps NWP conditions as it applies to the appropriate geographic and/or user:

- NWP Specific Terms and Conditions number 6, Suitable Material
- National General NWP Condition number 22. Designated Critical Resource Waters

#### **2.2.1.4.2 Programmatic Biological Evaluation for 10 Activities in the State of Washington for Species Listed or Proposed by National Marine Fisheries Service and U.S. Fish and Wildlife Service under the Endangered Species Act**

The Regulatory Branch of the U.S. Army Corps of Engineers, under its authorities pursuant to the Rivers and Harbors Act of 1899, the Federal Water Pollution Control Act, as amended (Clean Water Act), and the Marine Protection, Research, and Sanctuaries Act of 1972 (Ocean Dumping Act), evaluates applications for permits for work in waters of the U.S. [33 CFR Parts 320 through 330; 40 CFR Part 230]. Approvals or other decisions in the permit process constitute federal actions, and the Corps must ensure that its actions are in compliance with other major federal statutes and regulations. Among those is the federal Endangered Species Act of 1973, as amended. Under Section 7 of the ESA.

This Programmatic Biological Evaluation (PBE) covers 10 activities that may affect but are Not Likely to Adversely Affect (NLAA) the listed species, Distinct Population Segments (DPSs)/Evolutionarily Significant Units (ESUs) or designated critical habitat, jeopardize the continued existence of proposed species, or destroy or adversely modify proposed critical habitat and identifies measures to avoid or minimize adverse effects (Corps, 2008).

In the event that a listed species is present in the area where a project requires a hydraulic permit the Corps PBE may hold the permittee to a higher requirement than any of the following proposed changes to the hydraulic rule code.

**Proposed Chapter 220-660-120, Common freshwater construction provisions**

**Proposed Chapter 220-660-130, Streambank protection and lake shoreline stabilization**

**Proposed Chapter 220-660-140, Residential and public recreational docks, piers, ramps, floats, watercraft lifts, and buoys in freshwater areas (for piling replacement and mooring buoys)**

**Proposed Chapter 220-660-160, Marinas and terminals in freshwater areas**

**Proposed Chapter 220-660-180 Sand and gravel removal (stream and habitat restoration)**

**Proposed Chapter 220-660-190 Water crossings (stream and habitat restoration)**

**Proposed Chapter 220-660-200 Fish passage improvement structures (stream and habitat restoration)**

**Proposed Chapter 220-660-210 Channel relocation and realignment (stream and habitat restoration)**

**Proposed Chapter 220-660-220 Large woody material placement, repositioning, and removal in freshwater areas (stream and habitat restoration)**

**Proposed Chapter 220-660-250 Water diversions and intakes (stream and habitat restoration)**

**Proposed Chapter 220-660-360, Common construction provisions for saltwater areas**

**Proposed Chapter 220-660-370, Bulkheads and other bank protection in saltwater areas**

**Proposed Chapter 220-660-380, Residential and public recreational docks, piers, ramps, floats watercraft lifts, and buoys in saltwater areas (for piling replacement and mooring buoys)**

**Proposed Chapter 220-660-400, Marinas and terminals in saltwater areas**

#### **2.2.1.4.3 Approved work windows for fish protection**

The Regulatory Branch of the U.S. Army Corps of Engineers (Corps) evaluates applications for permits for work in waters of the U.S. [33 CFR Parts 320 through 330; 40 CFR Part 230]. The Corps regulatory program is based on its authorities pursuant to the Rivers and Harbors Act of 1899, the Federal Water Pollution Control Act, as amended (Clean Water Act), and the Marine Protection, Research, and Sanctuaries Act of 1972 (Ocean Dumping Act). At the conclusion of the evaluation process, the Corps decides to either issue or deny the permit for the proposed work.

The Corps permit decision is considered a Federal action that must comply with the Endangered Species Act (ESA). The ESA is administered by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). NMFS has ESA jurisdiction over salmon, other marine fish, marine mammals, and marine reptiles. USFWS has ESA jurisdiction over birds, terrestrial animals, plants, amphibians, and most freshwater fish. Under Section 7 of the ESA, the Seattle District Corps must consult with the NMFS and the USFWS on its permit program on any permit application for proposed work which may affect threatened or endangered species, or their designated critical habitat. With listings of many fish species as threatened or endangered, the majority of permit applications in the state of Washington will likely involve some elements that require Section 7 evaluation. In addition to fish, other threatened and endangered plants and animals occur in various areas of the state.

In the event that a listed species is present in the area where a project requires a hydraulic permit the Corps work windows (Corps, a) may hold the permittee to a higher requirement that any of the following proposed changes to the hydraulic rule code and therefore the economic impact attributed to the proposed rule code would be minimized or zero.

#### **Proposed Chapter 220-660-110, Authorized work times in freshwater areas.**

#### **Proposed Chapter 220-660-330, Authorized Work Times in Saltwater Areas**

#### **2.2.1.4.4 United States District Court Western District of Washington at Seattle Permanent Injunction Regarding Culvert Correction, No. C70-9213, Subproceeding No. 01-1**

The injunction orders (U.S. District Court, 2013)

*... the State of Washington, the Washington State Department of Transportation (WSDOT), the Washington State Department of Fisheries and Wildlife (WDFW), the Washington State Department of Natural Resources (DNR), and the Washington State Parks and Recreation Commission (State Parks), their agents, officers, employees, successors in interest, and all persons acting in concert or participation with any of them (Defendants), are permanently enjoined and restrained to obey, to respect, and to comply with all rulings of this Court*

*...Within six months of the date of this injunction, the Defendants, in consultation with the Plaintiff Tribes and the United States, shall prepare a current list, or lists if different by agency (the List), of all culverts under state-owned roads within the Case Area existing as of the date of this injunction, that are salmon barriers. In compiling the List, the Defendants shall use the barrier assessment methodologies in the Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual (WDFW 2000) (WDFW Assessment Manual).*

*...In carrying out their duties under this injunction, the Defendants shall design and build fish passage at each barrier culvert on the List in order to pass all species of salmon at all life stages at all flows where the fish would naturally seek passage ...*

*...Any new culvert constructed by the Defendants in the future on salmon waters within the Case Area and any future construction to provide fish passage at State barrier culverts on such waters shall be done in compliance with the standards set out in this injunction...*

...fish passage shall be achieved by (a) avoiding the necessity for the roadway to cross the stream, (b) use of a full span bridge, (c) use of the “stream simulation” methodology described in *Design of Road Culverts for Fish Passage* (WDFW, 2003) or *Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road - Stream Crossings* (U.S. Forest Service, May 2008), which the parties to this proceeding have agreed represents best science currently available for designing culverts that provide fish passage.

The injunction overlaps with the requirements of the following proposed changes to the hydraulic rule code:

**Proposed Chapter 220-660-190, Water Crossing Structures.** The proposed rule changes generally describe design criteria that will achieve the following; provide unimpeded passage for all species of adult and juvenile fishes and maintain the physical characteristics of a natural stream channel throughout the water crossing.

## **2.2.2 Washington State**

### **2.2.2.1 Shoreline Management Act of 1971, Chapter 90.58 RCW**

WAC Chapter 173-26 implements the requirements the Shoreline Management Act (SMA) of 1971 (chapter 90.58 RCW). The overarching goal of the act is “to prevent the inherent harm in an uncoordinated and piecemeal development of the state’s shoreline.” (ECY, a). The Act applies to all 30 counties and more than 200 towns and cities that have shorelines of the state within their boundaries.

WAC Chapter 173-26 details governing principles of the guidelines and standards for implementing the SMA. Implementation of the SMA includes development of Shoreline Master Programs (SMPs) by local jurisdictions. Standards for SMPs described in Chapter 173-26 of the WAC require similar or the same provisions as many of the proposed hydraulic code rule changes and thus WDFW’s proposed rule changes could have no, or a reduced, economic impact.

WDFW’s proposed rule changes which are related and/or similar to SMP guideline or standard, and the specific WAC follow.

#### **PROPOSED Chapter 220-660-080, Mitigation provisions for hydraulic projects:**

WAC 173-26-201(2)(c) and (e) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-201>)

(c) Master programs shall contain policies and regulations that assure, at minimum, no net loss of ecological functions necessary to sustain shoreline natural resources.

(e) Environmental impact mitigation. To assure no net loss of shoreline ecological functions, master programs shall include provisions that require proposed individual uses and developments to analyze environmental impacts of the proposal and include measures to mitigate environmental impacts not otherwise avoided or mitigated by compliance with the master program and other applicable regulations.

WAC 173-26-221(2)(a) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-221>):

...shoreline master programs must provide for management of critical areas designated as such ... located within the shorelines of the state with policies and regulations...

#### **PROPOSED Chapter 220-660-100, Freshwater habitats of special concern:**

- WAC 173-26-201(3)(d)(ix) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-201>):  
*Special area planning. Some shoreline sites or areas require more focused attention than is possible in the overall master program development process due to complex shoreline ecological issues, changing uses, or other unique features or issues. In these circumstances, the local government is encouraged to undertake special area planning. Special area planning also may*

be used to address: Public access, vegetation conservation, shoreline use compatibility, port development master planning, ecological restoration, or other issues best addressed on a comprehensive basis. The resultant plans may serve as the basis for facilitating state and local government coordination and permit review.

- WAC 173-26-201(2)(c) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-201>):  
*Master programs ... should establish and apply:*
  - *Environment designations with appropriate use and development standards; and*
  - *Provisions to address the impacts of specific common shoreline uses, development activities and modification actions; and*
  - *Provisions for the protection of critical areas within the shoreline; and*
  - *Provisions for mitigation measures and methods to address unanticipated impacts.**... the master program should ensure that development will be protective of ecological functions necessary to sustain existing shoreline natural resources and meet the standard.*
- WAC 173-26-221 (2)(a)(ii) (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-221>) lists the principles and standards for management of critical areas.

**PROPOSED Chapter 220-660-130, Streambank protection and lake shoreline stabilization**

- WAC 173-26-231(3)(a) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-231>):  
*In order to implement RCW 90.58.100(6) and avoid or mitigate adverse impacts to shoreline ecological functions ... master programs should include standards setting forth the circumstances under which alteration of the shoreline is permitted, and for the design and type of protective measures and devices.*

The WAC then proceeds to list standards to implement the principles described above.

WAC 173-26-201(c) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-201>):

*(c) Protection of ecological functions of the shorelines. This chapter implements the act's policy on protection of shoreline natural resources through protection and restoration of ecological functions necessary to sustain these natural resources....*

**PROPOSED Chapter 220-660-140, Residential docks, watercraft lifts, and buoys in freshwater areas and**

**PROPOSED Chapter 220-660-150, Boat ramps and launches in freshwater areas**

- WAC 173-26-231(3)(b) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-231>):  
*Piers and docks, ..., shall be designed and constructed to avoid or, if that is not possible, to minimize and mitigate the impacts to ecological functions, critical areas resources such as eelgrass beds and fish habitats and processes such as currents and littoral drift. ... Master programs should require that structures be made of materials that have been approved by applicable state agencies.*

**PROPOSED Chapter 220-660-160, Marinas and terminals in freshwater areas**

- WAC 173-26-231(3)(a)(iii)(F)(d) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-231>):  
*Breakwaters, jetties, groins, and weirs shall be designed to protect critical areas and shall provide for mitigation according to the sequence defined in WAC 173-26-201 (2)(e).*

**PROPOSED Chapter 220-660-170, Dredging in freshwater areas and**

**PROPOSED Chapter 220-660-180, Sand and gravel removal**

- WAC 173-26-231(3)(a)(iii)(F)(f) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-231>):  
*Dredging and dredge material disposal. Dredging and dredge material disposal shall be done in a manner which avoids or minimizes significant ecological impacts and impacts which cannot be avoided should be mitigated in a manner that assures no net loss of shoreline ecological functions.*
- WAC 173-26-241 states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-241>):  
*Master programs shall establish a comprehensive program of use regulations for shorelines and shall incorporate provisions for specific uses consistent with the following as necessary to assure consistency with the policy of the act .... [with respect to mining] ...A shoreline master program ...ensure that when mining or associated activities in the shoreline are authorized, those activities will be properly sited, designed, conducted, and completed so that it will cause no net loss of ecological functions of the shoreline*

**PROPOSED Chapter 220-660-240, Pond construction and**

**PROPOSED Chapter 220-660-250, Water diversions and intakes**

- WAC 173-26-241 states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-241>):  
*Master programs shall establish a comprehensive program of use regulations for shorelines and shall incorporate provisions for specific uses consistent with the following as necessary to assure consistency with the policy of the act .... [with respect to ponds, diversions and intakes] ...In-stream structures shall provide for the protection and preservation, of ecosystem-wide processes, ecological functions, and cultural resources, including, but not limited to, fish and fish passage, wildlife and water resources, shoreline critical areas, hydrogeological processes, and natural scenic vistas. The location and planning of in-stream structures shall give due consideration to the full range of public interests, watershed functions and processes, and environmental concerns, with special emphasis on protecting and restoring priority habitats and species*

**PROPOSED Chapter 220-660-320, Saltwater habitats of special concern**

- WAC 173-26-~~242~~221 states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-221>):  
*Master programs shall establish a comprehensive program of use regulations for shorelines and shall incorporate provisions for specific uses consistent with the following as necessary to assure consistency with the policy of the act .... [with respect to ponds, diversions and intakes] ...In-stream structures shall provide for the protection and preservation, of ecosystem-wide processes, ecological functions, and cultural resources, including, but not limited to, fish and fish passage, wildlife and water resources, shoreline critical areas, hydrogeological processes, and natural scenic vistas. The location and planning of in-stream structures shall give due consideration to the full range of public interests, watershed functions and processes, and environmental concerns, with special emphasis on protecting and restoring priority habitats and species*
- WAC 173-26-221 (2)(a)(ii) (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-221>) lists the principles and standards for management of critical areas.

**PROPOSED Chapter 220-660-370, Bank protection in saltwater areas and**

**PROPOSED Chapter 220-660-380, Residential and public recreational docks, piers, ramps, floats watercraft lifts, and buoys in saltwater areas and**

**PROPOSED Chapter 220-660-390, Boat ramps and launches in saltwater areas and**

**PROPOSED Chapter 220-660-400, Marinas and terminals in saltwater areas and**

**PROPOSED Chapter 220-660-410, Dredging in saltwater areas**

- WAC 173-26-221(2)(c)(iii)(C) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-221>):  
*Docks, piers, bulkheads, bridges, fill, floats, jetties, utility crossings, and other human-made structures shall not intrude into or over critical saltwater habitats except when all of the conditions below are met:*
  - *The public's need for such an action or structure is clearly demonstrated and the proposal is consistent with protection of the public trust, as embodied in RCW [90.58.020](#);*
  - *Avoidance of impacts to critical saltwater habitats by an alternative alignment or location is not feasible or would result in unreasonable and disproportionate cost to accomplish the same general purpose;*
  - *The project including any required mitigation will result in no net loss of ecological functions associated with critical saltwater habitat.*
  - *The project is consistent with the state's interest in resource protection and species recovery.*
- WAC 173-26-231(3)(a) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-231>):  
*In order to implement RCW 90.58.100(6) and avoid or mitigate adverse impacts to shoreline ecological functions ... master programs should include standards setting forth the circumstances under which alteration of the shoreline is permitted, and for the design and type of protective measures and devices.*

The WAC then proceeds to list standards to implement the principles described above.

**PROPOSED Chapter 220-660-440, Utility crossing in saltwater areas**

- WAC 173-26-241 states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-430>):  
*In-stream structures shall provide for the protection and preservation, of ecosystem-wide processes, ecological functions, and cultural resources, including, but not limited to, fish and fish passage, wildlife and water resources, shoreline critical areas, hydrogeological processes, and natural scenic vistas.*

**2.2.2.2 Water Pollution Control, Chapter 90.48 RCW**

WAC Chapter 173-201A implements the requirements the Water Pollution Control Act (chapter 90.48 RCW). WAC 173-201A establishes water quality standards for surface waters of the state of Washington consistent with public health and public enjoyment of the waters and the propagation and protection of fish, shellfish, and wildlife. All actions must comply with this chapter. As part of this chapter:

- (a) All surface waters are protected by numeric and narrative criteria, designated uses, and an antidegradation policy.
- (b) Based on the use designations, numeric and narrative criteria are assigned to a water body to protect the existing and designated uses.
- (c) Where multiple criteria for the same water quality parameter are assigned to a water body to protect different uses, the most stringent criteria for each parameter is to be applied.

WDFW's proposed rule changes which are related and/or similar to Water Pollution Control guideline or standard, and the specific WAC follow.

**PROPOSED Chapter 220-660-080, Mitigation provisions for hydraulic projects:**

- WAC 173-26-221(c)(i)(F) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-221>):

(F) *Compensatory mitigation shall be allowed only after mitigation sequencing is applied and higher priority means of mitigation are determined to be infeasible. Requirements for compensatory mitigation must include provisions for:*

(I) *Mitigation replacement ratios or a similar method of addressing the following:*

- *The risk of failure of the compensatory mitigation action;*
- *The length of time it will take the compensatory mitigation action to adequately replace the impacted wetland functions and values;*
- *The gain or loss of the type, quality, and quantity of the ecological functions of the compensation wetland as compared with the impacted wetland.*

(II) *Establishment of performance standards for evaluating the success of compensatory mitigation actions;*

(III) *Establishment of long-term monitoring and reporting procedures to determine if performance standards are met; and*

(IV) *Establishment of long-term protection and management of compensatory mitigation sites.*

*Credits from a certified mitigation bank may be used to compensate for unavoidable impacts.*

### **2.2.2.3 Pollution Disclosure Act of 1971, Chapter 92.50 RCW**

WAC Chapter 173-201A implements the requirements the Pollution Disclosure Act Of 1971 (chapter 90.50 RCW). The chapter sets discharge standards which represent "all known, available, and reasonable methods" of prevention, control, and treatment for domestic wastewater facilities which discharge to waters of the state.

WDFW's proposed rule changes which are related and/or similar to Pollution Disclosure Act guideline or standard, and the specific WAC follow.

#### **PROPOSED Chapter 220-660-120, Common freshwater construction provisions**

- WAC 173-201A-200 (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-201A-200>) lists the fresh water designated uses and all management criteria.

#### **PROPOSED Chapter 220-660-310, Tidal reference area**

- WAC 173-201A-210 states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-210>):

### **2.2.2.4 Aquatic Resources Mitigation, RCW 90.74**

The legislature determined that the state lacked a clear policy relating to the mitigation of wetlands and aquatic habitat for infrastructure development.

WDFW's proposed rule changes which are related and/or similar to Aquatic Resources Mitigation guideline or standard, and the specific WAC follow.

#### **PROPOSED Chapter 220-660-080, Mitigation provisions for hydraulic projects**

- RCW 90.74.005 (2) and (3) state (<http://apps.leg.wa.gov/RCW/default.aspx?cite=90.74.005>):  
*...it is the policy of the state to authorize innovative mitigation measures by requiring state regulatory agencies to consider mitigation proposals for projects that are time, designed, and located in a manner to provide equal or better biological function and... to authorize local governments to accommodate the goals of this chapter.*



**2.2.2.5 Fish Passage (RCW 77.57)**

Washington law has required since the nineteenth century that dams and obstructions in streams be passable to fish<sup>1</sup>. That law was applied to highway culverts in 1950<sup>2</sup>. RCW 77.57 "...a dam or other obstruction across or in a stream shall be provided with a durable and efficient fishway approved by the director." This law has been applied to culverts and all fish species.

WDFW's proposed rule changes which are related and/or similar to Aquatic Resources Mitigation guideline or standard, and the specific WAC follow:

**PROPOSED Chapter 220-110-200, Fish Passage Improvement Structures**

- RCW 77.57.030(1) states (<http://apps.leg.wa.gov/RCW/default.aspx?cite=77.57.030>):  
... a dam or other obstruction across or in a stream shall be provided with a durable and efficient fishway approved by the director. Plans and specifications shall be provided to the department prior to the director's approval. The fishway shall be maintained in an effective condition and continuously supplied with sufficient water to freely pass fish.
- WAC 173 -26-221 (c)(iv)(C)(I) states (<http://apps.leg.wa.gov/wac/default.aspx?cite=173-26-221>):  
Provide for the protection of ecological functions associated with critical freshwater habitat as necessary to assure no net loss of ecological functions.

**2.2.3 Summary Baseline**

**Table 1** summarizes the baseline data presented above. Included in the table are the number and title of the proposed WAC, an icon indicating whether there is an economic impact and the assumption on which the economic impact is based. The icons are defined as:

- ⊖ **No economic impact** – the proposed rule code does not describe design, construction or maintenance standards or the standards do not represent a significant change from the existing rules
- Economic impact but **not attributable** to proposed rule change – an existing regulation, protocol, standard, or judicial finding requires the same, or more restrictive, action as the proposed rule change. Therefore, the cost of implementing the rule change would be attributed to the existing regulation, protocol, standard or judicial finding.
- ◐ Economic **cost partially attributable** to proposed rule change – an existing regulation, protocol, standard, or judicial finding requires the similar, or less restrictive, action as the proposed rule change. Therefore, the cost of implementing the rule change would be attributed to the existing regulation, protocol, standard or judicial finding. Also, in cases where an applicant is exempt from obtaining a permit under existing regulations, such as the Section 4040 exemption for farming, ranching and silviculture.
- Economic **cost attributable** to proposed rule change – there is no other existing regulation, protocol, standard or judicial finding that requires the same action, therefore the entire cost of implementing the proposed changes is an economic impact caused by the rule change.

<sup>1</sup> Washington State (1890). Protection of Fish 1889-90 Wash. Sess. Laws Pages 107-108.

<sup>2</sup> Washington State (1950). 1949-51 Wash. Op. Att'y Gen., No. 304 (July 19, 1950).



Economic **savings attributable** to proposed rule change –proposed change is a cost savings.

The assumptions include: 1) the related regulation or ruling (as described in detail above) or 2) the proposed change from the existing code, if any.

**Table 1. Summary of Baseline Data**

Proposed WAC Sections		Econ Impact	Assumptions	Related Regulation or Ruling (a)
Number	Title			
220-660-010	Purpose	⊖	Consistent with current rules	
220-660-020	Instructions for using chapter	⊖	Consistent with current rules	
220-660-030	Definitions	⊖	Consistent with current rules	
220-660-040	Applicability of hydraulic project approval requirements	⊕	<b>Exempts portable boat hoists and scientific measurement devices</b>	
220-660-050	Procedures — hydraulic project approvals	⊕	<b>Allows use of a General HPA (GHPA)</b>	
220-660-060	Integration of hydraulic project approvals and forest practices applications	⊖	No change to current rules	
220-660-070	Changes to hydraulic project approval technical requirements	⊖	No change to current rules	
220-660-080	Mitigation requirements for hydraulic projects	⊖	Consistent with other regulations <b>however 404 Ag exemption for ranching, farming and silviculture</b>	Shoreline Mgmt Act, Corps NWP
220-660-090	Technical requirements	⊖	Consistent with current rules	
220-660-100	Freshwater habitats of special concern	⊖	Consistent with other regulations	Shoreline Mgmt Act
220-660-110	Authorized work times in freshwater areas	⊕	Consistent with and/or <b>less restrictive</b> than other regulations	Corps NWP and approved work windows
220-660-120	Common freshwater construction provisions	⊖	Consistent with other regulations <b>however 404 Ag exemption for ranching, farming and silviculture and SMA does not apply to streams under 20 cfs</b>	Water Pollution Control Act; WSDOT Fish Exclusion Protocols and Standards; Corps NWP and NMFS Programmatic consultation
220-660-130	Streambank protection and lake shoreline stabilization	⊖	Consistent with other regulations <b>however the 404 Ag exemption for ranching, farming and silviculture and SMA does not apply to streams under 20 cfs.</b>	Shoreline Mgmt Act; Corps NWP
220-660-140	Residential docks, watercraft lifts, and buoys in freshwater areas	⊖	Consistent with other regulations	Shoreline Mgmt Act; Corps NWP and NMFS Programmatic consultation
220-660-150	Boat ramps and launches in freshwater areas	⊖	Consistent with other regulations	Shoreline Mgmt Act; Corps NWP and NMFS Programmatic consultation.

Proposed WAC Sections		Econ Impact	Assumptions	Related Regulation or Ruling (a)
Number	Title			
220-660- 160	Marinas and terminals in freshwater areas	○	Consistent with other regulations	Shoreline Mgmt Act; Corps NWP and NMFS Programmatic consultation.
220-660- 170	Dredging in freshwater areas	⊖	Consistent with other regulations however <b>requires a survey.</b>	Shoreline Mgmt Act; Corps NWP
220-660- 180	Sand and gravel removal	⊖	Consistent with current rules	Shoreline Mgmt Act; Corps NWP
220-660- 190	Water crossing structures	⊖	Consistent with other regulations <b>however 404 Ag exemption for ranching, farming and silviculture</b>	US versus Washington State, No. C70 - 9213; Corps NWP
220-660- 200	Fish passage improvement structures	○	Consistent with other regulations	Corps NWP and NMFS Programmatic consultation
220-660- 210	Channel change/realignment	⊖	Consistent with current rules	
220-660- 220	Large woody material placement, repositioning, and removal in freshwater areas	⊖	Consistent with current rules	
220-660- 230	Beaver dam management	⊕	New rule, <b>removing beaver dams can be a cost savings</b>	
220-660- 240	Pond construction	○	Consistent with current rules	Shoreline Mgmt Act.
220-660- 250	Water diversions and intakes	○	Consistent with other regulations	Shoreline Mgmt Act.
220-660- 260	Outfall structures in freshwater areas	○	Consistent with other regulations	Corps NWP
220-660- 270	Utility crossings in freshwater areas	○	Consistent with other regulations	Corps NWP
220-660- 280	Felling and yarding of timber	⊖	Consistent with current rules	
220-660- 290	Aquatic plant removal and control	⊖	Consistent with current rules	
220-660- 300	Mineral prospecting	⊕	<b>No need for individual permit</b>	
220-660- 310	Tidal reference areas	⊖	Consistent with current rules	
220-660- 320	Saltwater habitats of special concern	○	Consistent with other regulations	Shoreline Mgmt Act
220-660- 330	Authorized work times in saltwater areas	○	Consistent with other regulations	Corps Approved Work Windows
220-660- 340	Intertidal forage fish spawning bed surveys	⊖	Consistent with current rules	
220-660- 350	Seagrass and macroalgae habitat surveys	●	<b>May require a survey.</b>	
220-660- 360	Common saltwater construction provisions	⊖	Consistent with other regulations <b>however 404 Ag exemption for ranching, farming and silviculture</b>	Shoreline Mgmt. Act; Corps programmatic consultation and Corps NWP

Proposed WAC Sections		Econ Impact	Assumptions	Related Regulation or Ruling (a)
Number	Title			
220-660- 370	Bank protection in saltwater areas	○	Consistent with other regulations	Shoreline Mgmt. Act; Corps programmatic consultation and Corps NWP
220-660- 380	Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in saltwater areas	○	Consistent with other regulations	Shoreline Mgmt Act; Corps NWP
220-660- 390	Boat ramps and launches in saltwater areas	○	Consistent with other regulations	Shoreline Mgmt. Act; Corps programmatic consultation and Corps NWP
220-660- 400	Marinas and terminals in saltwater areas	○	Consistent with other regulations	Shoreline Mgmt Act
220-660- 410	Dredging in saltwater areas	⊖	Consistent with other regulations however <b>may require a survey.</b>	Shoreline Mgmt Act Corps NWP
220-660- 420	Artificial Aquatic Habitat Structures	⊕	New section, provides for voluntary installation of structures for restoration or recreation purposes	
220-660- 430	Outfall and tide and flood gate structures in saltwater areas	○	Consistent with other regulations	Shoreline Mgmt Act Corps NWP
220-660- 440	Utility crossings in saltwater areas	○	Consistent with other regulations	Corps NWP
220-660- 450	Test boring in saltwater areas	○	Consistent with other regulations	Corps NWP
220-660- 460	Informal appeal of adverse administrative actions	⊕	No change to current rules	
220-660- 470	Formal appeal of administrative actions	⊕	No change to current rules	
220-660- 480	Compliance	⊕	Consistent with current rules	

(a) Source of the Related Regulation or Ruling: Thurston, R., WDFW and Barnard, B, WDFW.

In the next section assumptions about both the frequency with which these types of HPA's are submitted as well as estimates of the cost of each proposed change will be reviewed.

### 3 Data Profile, Methods and Results

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WDFW maintains a database of Hydraulic Project Approval (HPA) applications. The database contains information about individual applications including the year the application was submitted, the status of the application, the name of the company (or individual) submitting the application and categorizes the applicants into groups. The applicant groups are:

- Agriculture, including farms, timber companies and local dike, drainage and irrigation districts
- Single Family Residence
- Multiple Family Use including homeowners associations,
- Commercial/Industrial, including energy companies, land development, private marinas, etc.
- Government, including federal, tribal, state and regional
- Non-Profit Agency Public,
- Non-Profit Agency Private

The method used to estimate the probable costs of the proposed rule changes answered the following questions:

- How many HPAs will be submitted annually that have to meet the requirements of a proposed rule change for which there are no related regulations (see Table 1)?
- What is a reasonable range of estimated costs for those proposed rule changes?

Estimates of both the range of costs and the annual volume of HPAs are used to estimate a range of implementation costs of the proposed rule changes. For example if a proposed rule change is likely to increase project costs significantly but the likelihood that any project will be effected by the proposed change is low, then the expected cost of the proposed rule change could be low. Conversely, if the cost of implementing a proposed rule change on any one project is relatively low, but the proposed rule change would likely impact a relatively high percentage of projects seeking an HPA then the expected cost of the proposed rule change could be high.

In addition to understanding the potential costs and annual number of proposed rule change this analysis also answered the following:

- who (which entities) might be impacted by the proposed rule changes, e.g. federal and state agencies, tribes, commercial and industrial users, residential, etc.?

Understanding the type of entity (e.g. agriculture, government, etc.) impacted by the proposed rule changes contributes to the Small Business Economic Impact Statement, which estimates whether a small business is disproportionate affected by the proposed rule changes. Also, understanding which entity might be impacted helps estimate the number of HPAs that would be exempt from the 404 permitting requirement.

To answer two of the above three questions; 1) how many HPAs are submitted in one year and 2) which applicants might be impacted by the proposed rule change, the analysis assumed that the historical record of HPAs, that is - the types of projects that have needed permits and the types of entities that applied - represents the best estimate of future projects and applicants.

WDFW maintains a database of Hydraulic Project Approval (HPA) applications (Chapman, 2014a). **Table 2** shows the number of HPA's issued per year from 2008 through 2012. On average over 2,500 applications are issued per year.

**Table 2. Number of HPAs issued per year, 2008-2012, all projects, all applicants, excluding forestry.**

Year	2008	2009	2010	2011	2012	Grand Total	5-Year Average
HPA Count	2,657	2,666	2,177	2,456	2,782	12,738	2,548

Source: Barber, E. 2014.

What follows is a description of the historical record of HPAs issued over the 5-year period from 2008 to 2012, including an estimate of how many applications would have been impacted by the proposed rules had the rules been in effect during that period of time. Also, a description of the estimated costs of each HPA is described.

### 3.1 Who Applies for HPAs?

The WDFW HPA database contains information about individual applications including (but not limited to) the:

- year the application was submitted,
- status of the application (pending, issued, hold, etc.)
- type of application (e.g. forest practice, JARPA, public notice, etc.),
- description of the project
- name of the company (or individual) submitting the application
- applicant groups (e.g. government, agriculture, commercial/industrial, residential, etc.)

**Table 3** lists the number of HPA's issued between 2008 and 2012 by applicant group. Single family residences and government are the top two applicant groups, each individually representing just over 35.0 percent of all the HPAs, for a combined total of 70 percent of the HPAs for the time period. Agricultural applicants are third in volume, with 14.0 percent of the HPAs from 2008-2012, followed by commercial/industrial applicants submitting 8.0 percent of all HPAs. The remainder of the applicant groups represent less than 6.0 percent of all HPA's for the study period.

**Table 3. Total HPAs by Applicant Group, 2008 - 2012**

Applicant Group	Number of HPAs		Percent of Total
	5-Year Total	5-Year Average	
Agriculture	1,737	249	14%
Commercial/Industrial	964	961	8%
Government	4,606	46	36%
Multiple Family Use	225	90	2%
Non-Profit Agency Private	419	21	3%
Non-Profit Agency Public	101	937	1%
Single Family Residence	4,686	243	37%
Grand Total	12,738	2,548	100%

Source: Source: Barber, E. 2014.

### 3.2 How Many HPAs Could Be Subject to the Proposed Rule Changes?

**Table 4.** presents an estimate of the average annual number of HPAs, issued between 2008 and 2013, that 2013 that may have been subject to a proposed rule change, had the rules been in effect at the time. Note that any one HPA may be included in **Table 4** in multiple columns, as one HPA could be subject to more than one rule.

The majority of all HPAs, approximately 32.0 percent, issued between 2008 and 2013 were subject to proposed rule 220-660-190, water crossing structure. Twenty percent of all applications issued between 2008 and 2013 would have been subject to proposed rule 220-660-310, Tidal reference areas, and proposed rule 220-660-330, Authorized work times in saltwater areas. Thirteen percent of the HPAs would have been subject to five proposed rules; Freshwater habitats of special concern (220-660-100), Residential and public recreational docks, piers, ramps, floats, watercraft lifts, and buoys in freshwater areas (220-660-140), Saltwater habitats of special concern (220-660-320), Intertidal forage fish spawning bed surveys (220-660-340) and Seagrass and macroalgae habitat surveys (220-660-350). The remainder of the rules would have impacted ten percent or less of the HPAs

**Table 4. Estimate of the Average Annual Percent of Total HPAs by Proposed Rules, 2008-2013.**

Proposed WAC Sections		Percent of Total
Number	Title	
220-660-100	Freshwater habitats of special concern	12.9%
220-660-110	Authorized work times in freshwater areas	0.0%
220-660-120	Common freshwater construction provisions	0.0%
220-660-130	Streambank protection and lake shoreline stabilization	0.0%
220-660-140	Residential and public recreational docks, piers, ramps, floats, watercraft lifts, and buoys in freshwater areas	12.9%
220-660-150	Boat ramps and launches in freshwater areas	0.9%
220-660-160	Marinas and terminals in freshwater areas	0.3%
220-660-170	Dredging in freshwater areas	7.8%
220-660-180	Sand and gravel removal	0.3%
220-660-190	Water crossing structures	31.8%
220-660-200	Fish passage improvement structures	9.4%
220-660-210	Channel relocation and realignment	0.1%
220-660-220	Large woody material placement, repositioning, and removal in freshwater areas	7.1%
220-660-230	Beaver dam management	1.1%
220-660-240	Pond construction	0.3%
220-660-250	Water diversions and intakes	4.2%
220-660-260	Outfall structures in freshwater areas	1.8%
220-660-270	Utility crossings in freshwater areas	2.6%
220-660-280	Felling and yarding of timber	0.1%
220-660-290	Aquatic plant removal and control	0.3%

Proposed WAC Sections		Percent of Total
Number	Title	
220-660-300	Mineral prospecting	8.9%
220-660-310	Tidal reference areas	19.7%
220-660-320	Saltwater habitats of special concern	13.4%
220-660-330	Authorized work times in saltwater areas	19.7%
220-660-340	Intertidal forage fish spawning bed surveys	13.2%
220-660-350	Seagrass and macroalgae habitat surveys	13.4%
220-660-370	Bank protection in saltwater areas	5.9%
220-660380	Residential and public recreational docks, piers, ramps, floats, watercraft lifts and buoys in saltwater areas	5.2%
220-660-390	Boat ramps and launches in saltwater areas	0.7%
220-660-400	Marinas and terminals in saltwater areas	0.6%
220-660-410	Dredging in saltwater areas	0.6%
220-660-420	Artificial Aquatic Habitat Structures	0.4%

Source: Barber, E. WDFW 2014.

**Table 5** shows the annual average number of HPAs assumed to be subject to the proposed rule changes by applicant group. Included in Table 5 are the proposed rules that could potentially impact greater than 5.0 percent of the annual average number of HPAs. As seen in **Table 4**, 32.0 percent of the average annual HPAs are subject to the proposed rule 220-660-190, Water crossing structures. Of those HPAs the majority, 49.0 percent, are issued to governments. Twenty percent of the HPAs subject to the Water crossing structures proposed rule are issued to Agricultural and Forestry applicants. Sixteen percent of the HPAs subject to the Water crossing structures rule are issued to Commercial and Industrial applicants.

The Single Family Residence applicant group is issued the largest number of HPAs (64.0 percent) that are subject to the proposed Tidal reference area rule (220-660-310) and proposed Authorized work times in saltwater areas rule (220-660-330). Governments are issued 21.0 percent of HPAs subject to these two proposed rules.

Governments and Single family residents continue to be the two applicant groups with the majority of the HPAs subject to the proposed rule for nearly all other proposed rules except Fish passage improvement structures (220-660-200). With Fish passage improvement structures Governments are still issued the most (37.0 percent) of all HPAs however the Commercial/Industrial and Agriculture & Forestry applicant group receive 30.0 percent and 25.0 percent of the HPAs, respectively.



**Table 5. Estimated Five-Year Average Annual Number of HPAs by Rule and Applicant Group, Ordered by Volume, 2008-2012.**

Proposed WAC Sections		Agri. & Forestry	Commercial /Industrial	Govt	Multiple Family Use	Non-Profit Agency		Single Family Residence	Grand Total	Percent of Total
Number	Title					Private	Public			
<b>220-660-190</b>	Water crossing structures	159	133	393	9	17	4	95	810	32%
	<i>% by applicant</i>	20%	16%	49%	1%	2%	0%	12%	100%	
<b>220-660-310</b>	Tidal reference areas	7	36	104	13	19	3	319	501	20%
	<i>% by applicant</i>	1%	7%	21%	3%	4%	1%	64%	100%	
<b>220-660-330</b>	Authorized work times in saltwater areas	7	36	104	13	19	3	319	501	20%
	<i>% by applicant</i>	1%	7%	21%	3%	4%	1%	64%	100%	
<b>220-660-100</b>	Freshwater habitats of special concern	20	17	162	5	11	2	111	328	13%
	<i>% by applicant</i>	6%	5%	49%	2%	3%	1%	34%	100%	
<b>220-660-140</b>	Res. & public rec docks, piers, ramps, floats, watercraft lifts, and buoys in freshwater areas	12	23	33	14	16	1	228	327	13%
	<i>% by applicant</i>	4%	7%	10%	4%	5%	0%	70%	100%	
<b>220-660-320</b>	Saltwater habitats of special concern	6	32	83	12	16	1	192	342	13%
	<i>% by applicant</i>	2%	9%	24%	4%	5%	0%	56%	100%	
<b>220-660-340</b>	Intertidal forage fish spawning bed surveys	6	30	82	12	15	1	190	336	13%
	<i>% by applicant</i>	2%	9%	24%	4%	4%	0%	57%	100%	
<b>220-660-350</b>	Seagrass and macroalgae habitat surveys	6	32	83	12	16	1	192	342	13%
	<i>% by applicant</i>	2%	9%	24%	4%	5%	0%	56%	100%	
<b>220-660-200</b>	Fish passage improvement structures	294	361	445	1	31	6	57	1,195	9%
	<i>% by applicant</i>	25%	30%	37%	0%	3%	1%	5%	100%	
<b>220-660-300</b>	Mineral prospecting					5	2	1,130	1,137	9%
	<i>% by applicant</i>	0%	0%	0%	0%	0%	0%	99%	100%	
<b>220-660-170</b>	Dredging in freshwater areas	78	46	619	6	47	17	181	994	8%
	<i>% by applicant</i>	8%	5%	62%	1%	5%	2%	18%	100%	
<b>220-660-220</b>	Large woody material placement, repositioning, and removal in freshwater areas	63	51	479	15	92	13	191	904	7%
	<i>% by applicant</i>	7%	6%	53%	2%	10%	1%	21%	100%	
<b>220-660-370</b>	Bank protection in saltwater areas	7	34	142	13	23	3	527	749	6%
	<i>% by applicant</i>	1%	5%	19%	2%	3%	0%	70%	100%	

### 3.3 Cost Analysis

The estimated annual costs of the proposed rules changes that could be quantified ranges between \$291 thousand to \$3.6 million. Cost estimation, even when project specifications are known, is frequently plagued with uncertainties. In estimating costs for this analysis the project specifications are not known, creating a higher degree of uncertainty. Notwithstanding this uncertainty the costs and/or savings of the proposed rule changes were quantified where possible and qualified if not possible. The method used to estimate the costs is described below.

The first step in estimating potential costs of the proposed rule changes was to determine whether costs are best quantified or qualified for those proposed changes that were identified during the baseline analysis as having an economic impact fully or partially attributed to the proposed rule change (see **Table 1**). Secondly, for those proposed changes for which costs could be quantified, a range of possible costs impacts was obtained and an estimate of the number of HPAs that may be issued in one year was based on the number of HPAs issued from 2008 to 2013.

If project costs could be determined with some certainty, then the cost of the proposed rule changes was quantified. For example, the range of costs for Seagrass and macroalgae surveys was estimated with some degree of certain despite the fact that the cost of the survey could change depending on the geographic are of study. Also, the cost impact of common construction materials could be estimated, however given a wide range of material costs for projects requiring an HPA the best way to report an increase in construction costs was as a percent increase of existing construction materials.

If the range of costs could not be estimated with some degree of certainty, then the costs where qualified. For example, many of the provisions of the proposed changes do not contain numerical design criteria and alternatives to previously published WDFW design guidelines can be used when accepted by the Agency. Without numeric design criteria, and allowing for the flexibility to ask for Agency approval of various designs, there is little certainty on which to base a quantification of costs.

Additionally, the magnitude of the costs and/or savings incurred on potential projects under some of the proposed changes can vary widely depending on the circumstances. For example a project that falls under the proposed change to Streambank protection and lake shoreline stabilization section could vary widely depending on the length of the shoreline being stabilized, the feasible designs, etc. Additionally, in this case, the implementation costs attributable to the proposed changes would be incurred by a small subset of applicants, only those that are exempt from the Corps 404 permit (e.g. farming ranching and silviculture).

Assumptions used for the 1) cost estimate and 2) the estimated number of HPAs potentially affected for each proposed rules having potential to change costs is listed below

**220-660-040 Applicability of hydraulic project approval requirements.** The proposed rule exempts portable boat hoists and scientific measurement devices. WDFW's database of HPAs that have been issued does not contain the detailed information about boat hoists and scientific measurement devices. However it was assumed that the number of HPA impacted would be relatively small, so to be conservative the cost savings was not quantified.

**220-660-050 Procedures — hydraulic project approvals.** The proposed rule provides for the use of General HPAs (GHPAs), which are not provided for in the existing hydraulic rules. Currently WDFW issues statewide GHPAs to state agencies and regional GHPAs to cities and counties to improve efficiency and reduce permitting costs by issuing one GHPAs for multiple individual, similar projects. Since January 1, 2012 WDFW has issued 76 GHPAs (Thurston, 2014b).

The assumptions used to estimate the cost savings are:

1) the number of avoided permit applications is the difference between the number of GHPA issued to an agency and the number of individual projects completed under that GHPA. Only the statewide GHPAs were included in the estimate, to make the estimate conservative.

2) the cost savings per HPA is based on the application cost (\$150/application) and does not include staff time necessary to complete the application, again creating a conservative estimate of the cost savings..

The estimated annual cost savings ranges from \$11.4 thousand to \$143.0 thousand dollars.

**Table 6. Assumptions for Cost Savings from the General Hydraulic Project Approval.**

GHPA Agency	Year	Projects	No. GHPAs	Avoided Permits	Cost Savings
WSDOT	2010	950	7	940	\$141,000
WSDOT	2011	1,100	7	1,091	\$163,650
WSDOT	2012	570	7	561	\$84,150
WSDOT	2013	400	7	391	\$58,650
DNR	2012	10	3	7	\$1,050
ECY	2012	100	3	98	\$14,700
<b>Total</b>		4,080		4,073	\$463,200
<b>Annual Average</b>				582	\$77,200
<b>Standard Deviation</b>				434	\$65,790
<b>Low estimate</b>				148	\$11,410
<b>High estimate</b>				1,016	\$142,990

Source: Thurston, R. WDFW 2014b.

**220-660-080 Mitigation requirements for hydraulic projects** – The proposed rule change is consistent with existing Corps regulations. The Corps regulation provide a 404 exemption for farming, ranching and silviculture, therefore the only applicant group considered in the cost analysis is Agriculture and Forestry. The estimated annual number of HPA permits issued to Agriculture and Forestry applicants ranges between 325 and 390. The potential costs of implementing these mitigation requirements could not be estimated with any certainty and therefore is not quantified.

**220-660-110 Authorized work times in freshwater areas** - The proposed rule change is consistent with existing Corps regulations. The Corps regulation provide a 404 exemption for farming, ranching and silviculture, therefore the only applicant group considered in the cost analysis is Agriculture and Forestry. The estimated annual number of HPA permits issued to Agriculture and Forestry in the Freshwater environment ranges between 250 and 350. The potential cost savings of implementing these mitigation requirements could not be estimated with any certainty and therefore is not quantified.

**220-660-120 Common freshwater construction provisions** - The proposed rule change is consistent with existing Corps regulations. The Corps regulation provide a 404 exemption for farming, ranching and silviculture, therefore the only applicant group considered in the cost analysis is Agriculture and Forestry. The estimated annual number of HPA permits issued to Agriculture and Forestry in the Freshwater environment ranges between 250 and 350. The potential cost of implementing these mitigation requirements could not be estimated with any certainty and therefore is not quantified.

**220-660-130 Streambank protection and lake shoreline stabilization** - The proposed rule change is consistent with existing Corps regulations. The Corps regulation provide a 404 exemption for farming, ranching and silviculture, therefore the only applicant group considered in the cost analysis is Agriculture and Forestry. The estimated annual number of HPA permits issued to Agriculture and Forestry applicants ranges between 325 and 390. The potential costs of implementing these mitigation requirements could not be estimated with any certainty and therefore is not quantified.

**220-660-170 Dredging in freshwater areas** - - The proposed rule change is consistent with existing Corps regulations except WDFW may require a pre-project geomorphic analysis to determine potential impacts from the dredging and also may require multi-season pre- and post-dredge project bathymetric or biological surveys. The number of estimated annual number of HPA permits issued for dredging ranged between 175 and 275, or which between 10 and 25 are issued to Agriculture and Forestry applicants. The potential cost of implementing these mitigation requirements could not be estimated with any certainty and therefore is not quantified.

**220-660-190 Water crossing structures** - The proposed rule change is consistent with existing Corps regulations. The Corps regulation provide a 404 exemption for farming, ranching and silviculture, therefore the only applicant group considered in the cost analysis is Agriculture and Forestry. The estimated annual number of HPA permits issued to Agriculture and Forestry applicants ranges between 125 and 185. The potential costs of implementing these mitigation requirements could not be estimated with any certainty and therefore is not quantified.

**220-660-230 Beaver dam management** – The current rules do not have a provision for beaver dam management. Managing beaver dams is expected to save applicants money as it provides them the ability to protect property. The potential costs of implementing these mitigation requirements could not be estimated with any certainty and therefore is not quantified.

**220-660-300 Mineral prospecting** - The proposed rule does not require an individual permit and therefore will reduce applicants' costs. The potential number of permits and the cost savings of implementing these mitigation requirements could not be estimated with any certainty and therefore is not quantified.

**220-660-350 Seagrass and macroalgae habitat surveys** – The proposed change states WDFW may require an applicant to hire a qualified, department-trained biologist to conduct an [seagrass and macroalgae habitat survey for work that may impact seagrass and kelp; in herring spawning other macroalgae species intertidal forage fish spawning survey prior to work in potential surf smelt and Pacific sand lance spawning habitat or in documented surf smelt spawning areas where the spawning season is six months or longer](#). The estimated annual number of HPA permits issued to applicants that may be required to get a survey ranges between 300 and 380. The potential cost of a survey is estimated to range between \$1,200 and \$10,000 (Thurston 2014a, ~~(Swarts, 2014)~~). To be conservative the cost estimate assumes that every applicant that may have to be required to complete a survey is required to obtain one. The annual costs to implement this proposed rule change ranges between \$370,000 and \$3,770,000.

**220-660-360 Common saltwater construction provisions** - The proposed rule change is consistent with existing Corps regulations. The Corps regulation provide a 404 exemption for farming, ranching and silviculture, therefore the only applicant group considered in the cost analysis is Agriculture and Forestry. The estimated annual number of HPA permits issued to Agriculture and Forestry in the Marine environment ranges between 3 and 15. The potential cost of implementing these mitigation requirements is expected to be minimal.

**220-660-410 Dredging in saltwater areas** - The proposed rule change is consistent with existing Corps regulations except WDFW may require a pre-project geomorphic analysis to determine potential impacts from the dredging and also may require multi-season pre- and post-dredge project bathymetric or biological surveys. The number of estimated annual number of HPA permits issued for dredging is

expected to be relatively small. The potential cost of implementing these mitigation requirements could not be estimated with any certainty and therefore is not quantified.

**Table 7** presents the details of the cost analysis. The range of costs to implement the proposed changes, of the costs that have been quantified, is \$291,000 to \$3,594,000 annually. Many costs of proposed rule changes were not quantified but rather were qualified. Those HPAs for which the proposed cost was not estimated were generally not estimated because the range of project costs varies.

**Table 7. Quantified and Qualified Estimated Costs of Implementing Proposed Rule Changes**

Proposed Section Change		Est. Historical Permits	Econ. Impact	Estimated Annual HPA		Estimated Annual HPA		DRAFT Cost per HPA		DRAFT Cost Extended		Notes
Number	Title			Low	High	Low	High	Low	High	Low	High	
		(%)		(%)	(%)	(#)	(#)	(\$s)	(\$s)	(\$ 000s)	(\$ 000s)	
220-660-040	Applicability of hydraulic project approval requirements	0.0%	⊕	0.0%	0.0%	0	0	N/E	N/E	N/E	N/E	(i)
220-660-050	Procedures — hydraulic project approvals	N/E	⊕	N/E	N/E	526	1,176	-\$150	-\$150	-\$79	-\$176	(ii)
220-660-080	Mitigation requirements for hydraulic projects	N/E	⊖	9.0%	15.0%	325	390	N/E	N/E	N/E	N/E	(iii)
220-660-110	Authorized work times in freshwater areas	N/E	⊕	N/E	N/E	233	350	N/E	N/E	N/E	N/E	(i)
220-660-120	Common freshwater construction provisions	80.0%	⊖	72.0%	88.0%	233	264	0%	0%	\$0	\$0	(iv)
220-660-130	Streambank protection and lake shoreline stabilization	N/E	⊖	N/E	N/E	325	390	N/E	N/E	N/E	N/E	(v)
220-660-170	Dredging in freshwater areas	7.8%	⊖	7.0%	8.6%	4	4	N/E	N/E	N/E	N/E	(iv)
220-660-190	Water crossing structures	31.8%	⊖	28.6%	35.0%	146	178	N/E	N/E	N/E	N/E	(iv)
220-660-230	Beaver dam management	1.1%	⊕	1.0%	1.3%	26	32	N/E	N/E	N/E	N/E	
220-660-300	Mineral prospecting	8.9%	⊕	8.0%	9.8%	205	250	N/E	N/E	N/E	N/E	
220-660-350	Seagrass and macroalgae habitat surveys	13.4%	●	12.1%	14.8%	308	377	\$1,200	\$10,000	\$370	\$3,770	(vii)
220-660-360	Common freshwater construction provisions	80.0%	⊖	72.0%	88.0%	233	264	0%	0%	\$0	\$0	(iv)
220-660-410	Dredging in saltwater areas	0.6%	⊖	0.5%	0.6%	0	0	0%	0%	\$0	\$0	(vi)
<b>Total of estimated quantified impacts</b>										<b>\$291</b>	<b>\$3,594</b>	

N/A = Not Applicable; N/E = Not Estimated

(i) Unable to estimate the number of HPAs, also costs savings relatively small.

(ii) Number of HPAs estimated as the difference between the GHPAs issued and the number of individual projects completed under the GHPA. Cost conservatively estimated as the cost of the permit, not including labor to prepare the permit application.

(iii) Mitigation of the HPA applicants exempt from 404 permits, the cost of mitigation is project specific.

(iv) Sources: (a) Guy, 2011; (b) Stroud, 2011; (c) Kaczmarek, 2011; (d) Fabricatros and Manufactures Association; (e) Keidle, 2011. The number of HPAs was estimated where the number of applications is only those where Project\_Environ = Freshwater or Marine as appropriate and applicant group = Agric & forestry. Costs are the percent increase in construction costs for material that complies with the proposed rule.

(v) Unable to estimate the number of HPAs, also costs savings would range widely based on project specifics.

(vi) Potential impact for HPAs where applicant is exempt from a 404 permit, e.g. farming, ranching, silviculture and projects costs vary widely.

(vii) Swarts,2014, Thurston, 2014.

### 3.4 Benefits Included in the Analysis

The proposed rule changes are intended to “provide protection for all fish life through the development of a statewide system of consistent and predictable rules.”(WDFW, 2014). Protecting fish provides direct benefits to society (e.g. food, jobs, and recreation). In addition to these direct benefits other types of ecosystem services are also created and provide a benefit (MEA 2003). Examples of ecosystem services that pertain to WDFW’s proposed rule change include water quality maintenance, nutrient cycling, habitat formation, climate regulation, and biodiversity. In addition to these benefits protecting fish life may also provide human well-being benefits including material well-being, relationships with family and friends, and emotional and physical health (Plummer and Schneider 2009).

Several recent publications (e.g., Leschine and Peterson 2007, Batker et al. 2008) have described the economic benefits of fully functioning ecosystems, with an emphasis on Puget Sound. These publications have employed economic principles—for example, estimating the least-cost engineered solution to water quality improvements as a proxy for the water filtration services provided by healthy ecosystems. Although such calculations are beyond the scope of this analysis, it is worth noting that natural ecosystem functions have values that can be described in economic terms, as well as other values that cannot be described. One estimate of the value of fourteen goods and services provided by nature within the Puget Sound Basin ranges between \$9.7 billion and \$83.0 billion (Batker et.al. 2010)

The ongoing work of the Puget Sound Partnership’s Puget Sound Science Update also supports the assertion that protection and restoration of natural resources have social and economic value that can be measured in terms of human well-being. The Puget Sound Science Update is reviewing data that can be used as indicators for the social and economic state of the region (Puget Sound Partnership 2011). Additionally, work is underway to determine “how human well-being can be ... used (in principle) as an over-arching metric by which to evaluate the effectiveness and impacts of management actions” (Plummer and Schneider 2011).

Recent work by the ECY estimates a benefit of the rule to set instream flows and thus provide more salmon habitat in the Dungeness watershed. The report uses annual estimates of the value of salmon that range between \$268/adult spawner to \$400/ adult fish.<sup>3</sup> Using these numbers and an estimate that the proposed in stream flow rule will save between 751 and 1,360 spawning fish over 20 years. The total benefit of avoided salmon losses under the rule is 3.8 million - \$6.8 million.

WDFW did not estimate the number of fish which may be saved through implementation of these proposed rule changes, however the per fish value used by ECY estimate is useful in understanding the magnitude of the potential benefit.

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<sup>3</sup> 36 Based on a University of Washington study (Layton, et al. 1999), the 20-year average between high and low status quo salmon populations give us \$300 as the annual value for each adult spawner. Columbia River Initiative gave us existence values of \$268 (Huppert 2003). Bonneville Power Administration gave us restoration values of \$400 per adult fish. From these reports 16 year values for fish would range from \$4,288 to \$6,400. Ecology has chosen to use a 20-year real estimated value of \$5,000 for an adult returning spawner.



## 4 Small Business Economic Impact Statement

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The Regulatory Fairness Act, in RCW 19.85.040, directs that

*To determine whether the proposed rule will have a disproportionate cost impact on small businesses, the impact statement must compare the cost of compliance for small business with the cost of compliance for the ten percent of businesses that are the largest businesses required to comply with the proposed rules ...*

In RCW 19.85.020 (3) "Small business" is defined as

*... any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, and that has fifty or fewer employees.*

None of the proposed rule changes would have a disproportionate cost impact on small businesses. .

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## Appendix A Analysis of Eight Federally-Funded, County-Owned Bridges in Washington

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# Analysis of Eight Federally-Funded, County-Owned Bridges in Washington

Prepared by Bob Barnard, WDFW

June 27, 2014 (revised)

The following analysis examines 8 federally-funded bridges designed and built under existing rule to determine if the design would comply with the version 5 Chapter 220-660-190 WAC as currently proposed. In summary, 7 of the 8 bridges would comply (87%). One bridge was too short, although the design was negotiated after an appealed permit. One bridge had incomplete information, but it is likely that it would comply.

No	Stream	Road	Owner	Year	Complies w/ V.5 WACs
1	Snoqualmie R	Tolt Hill Rd	King Co.	2009	Yes
2	Sauk R	Sauk Prairie Rd.	Snohomish Co.	2006	Yes
3	NF Snoqualmie	N. Fork Rd.	King Co.	2007	Yes
4	May Ck	419th #572	Snohomish Co.	2010	Yes
5	Garrard Ck	Forrest Rd	Greys Harbor Co.	2011	Yes
6	Mormon Ditch	Hampton Rd #261	Whatcom Co.	2009	Yes
7	Xtrib. Elk R	Schmidt Rd	Greys Harbor Co.	2008	Yes*
8	Tahuya R	Belfair Tahuya Rd	Mason Co.	2010	No - too short
			*incomplete information but likely complies		

The analysis compares the design with each of the 7 provisions specifically for bridge design. These provisions are listed at the end of the report. Only the provision number is shown in each of the case studies.

## Snoqualmie R. at Tolt Hill Rd in King Co., 2009 – Complies with V. 5 WAC



This bridge crosses a large river with a wide floodplain. There are two 300 ft clear spans, one over the mainstem, the other over the LB floodplain. There are three shorter spans, approx. 120 ft each, over the RB floodplain. The approach road on the right is at floodplain elevation and is inundated at peak flows. This bridge replaces a similar one whose performance was good.

(3) (b) This bridge fully spans the bankfull channel and the approach is elevated above the floodplain. The roadway that crosses the remaining portion of the floodplain is not elevated and flood waters can easily cross it. Under the circumstances river functions are relatively unaffected by the bridge at this site.

- (4) (a) These are channel-spanning structures with good clearance and are assumed to pass wood (the size of transported wood is generally smaller than the bankfull channel).
- (4) (b) Considering that there is common overbank flow here, the bridge elements are inside OHW. The exemption is for mid-channel piers and these piers are better positioned in the overbank area than they would be in the channel itself. The RB abutment is also in within OHW but cannot be avoided and still produce an efficient design that minimizes all impacts.
- (4) (c) We did not examine hydraulic modeling for this bridge, but based on previous work on large floodplain rivers with flow over the approach road and full channel spanning structures, we do not expect that velocity will be significantly affected. It is also assume that in this designated floodway that zero rise was a design criteria and afflux is usually associated with an increase in velocity under or near the bridge.
- (4) (d) The Snoqualmie is an unusually stable channel that is not likely to change laterally for decades. Additionally, there are side spans that could accommodate more flow should a change occur.
- (4) (f) Bridge clearance is 6 ft.
- (4) (g) This bridge is on a deep foundation and does not require scour protection. How much was actually used is not clear from the plans, but very little was visible on site.

**Sauk R. at Sauk Prairie Rd. in Snohomish Co.**

**2006. Complies with V. 5 WAC**



This bridge crosses a large, relatively confined and sediment-rich river. There is a major constraint on the left bank; a long-established lumber mill encroaches about 300 ft into the river. The bridge owner attempted to negotiate a pull back to increase the width of the river at this point but was rebuffed. The right bank is also privately owned. The bridge replaces a similar one that had poor performance, but the constraints have not changed. The crossing consists of a 265 ft span over the main channel and a 213 ft span over the RB side channel. The bankfull width is approx. 375 ft and the active channel is about 940 ft. There are clearly wood and sediment transport issues at this crossing. Wood has accumulated on the mid-channel pier and the RB channel is filling in. Erosion is occurring on the right bank.



(3) (b) This crossing significantly affects up and downstream processes but an exception was made because there are manmade features in the floodplain that are outside the control of the owner and they are unlikely to be removed.

(4) (a) Wood movement is limited, but see (4) (e).

(4) (b) The pier and left bank abutment are likely within OHW. The mid channel pier is excepted and the abutment is excepted by (4) (e).

(4) (c) I did not review the modeling for this bridge, but my guess is that it did increase velocity, depending on how far u/s and d/s the cross section were. The reach just downstream of the bridge is likely to have high V and this could skew the average prevailing conditions.

(4) (d) The river really wants to move laterally but is constrained by the lumber mill, see (4) (e).

(4) (e) The lumber mill fill confines the channel and cannot be moved by the bridge owner.

(4) (f) The bridge is high with 9 ft of clearance.

(4) (g) The bridge is on deep foundations, and has not yet required countermeasures.

## NF Snoqualmie at N. Fork Rd. in King Co. 2007 - Complies with V. 5 WAC



This bridge crosses a relatively confined large river in the cascade foothills. The active channel is about 150 ft wide from aerials. Clear span is 168 ft. We do not know what the BFW is, but probably about OHWW which is about 120 ft, making the Factor of Safety about 1.3. There is some fill on the LB but it doesn't appear to constrict flow. It's hard to tell if there has been much effect on the morphology by this or the previous bridge. Very coarse bed – cobble boulder – which indicates fairly stable conditions.

(3)(b) The bridge cross section is stream-like and processes appear to be unconstrained.

(4) (a) The span is greater than active channel width so wood passage is assumed.

(4) (b) All of the bridge elements are outside OHW.

(4) (c) It stream is moderately confined with little floodplain and it is assumed that 4(b) governs span.

(4) (d) Considering the setting, we assume lateral stability, but there is a confluence just upstream that should have been considered in the bridge design.

(4) (f) Bridge clearance is 4.8 ft.

(4) (g) The bridge is founded on spread footings (assume bedrock in the vicinity). Boulders placed at abutment toe for protection. Considering the coarse bed material, these are probably low impact to habitat.

**May Ck at 419th Ave in Snohomish Co. 2010. Complies with V. 5 WAC.**



This 75 ft bridge crosses a medium-sized stream in rural Snohomish Co. Clear span is about 72 ft with vertical abutments. The 75 ft bridge was chosen over an “adequate” 60 ft bridge because it “fit the natural channel better” and provided better debris passage. There is no BFW measurement, but regional

regression gives about 30 ft, OHW width is from 30 – 40 ft. Channel width created in the bridge cross section is 50 ft which would give a FS of 1.1 to 1.7, depending on the actual channel width. The 100-year recurrence interval flood width is just above the re-sloped banks inside the bridge cross section. Bridge is skewed to the road and the abutments are angled similarly for good streamlines. The HEC RAS cross sections show overbank area but it is not inundated at 100 year flood. Estimated floodplain utilization ratio is 2, indicating confined, but this ratio was not specifically measured.

(3)(b) The bridge plan restored the stream cross section from the previous span of about 34 ft. No details on channel construction, bed material, etc., but it is assumed that these would adjust quickly over time to prevailing conditions.

(4) (a) The span is greater than BFW and will pass wood. The design specifically considered debris passage.

(4) (b) All of the bank elements are clear of OHW.

(4) (c) The channel is confined and this provision does not specifically apply. Nevertheless, the calculated velocity ratio very nearly 1.0.

(4) (d) Meander migration was not specifically addressed in the design. Considering the heavily vegetated banks and possible geologic controls (bedrock, coarse bed materials) this is probably not a “meandering” stream and lateral migration not anticipated unless precipitated by local scour.

(4) (f) There is 2 ft of clearance. This is less than 3, but may be acceptable under the circumstances. An engineering justification was not included in the application materials.

(4) (g) It is not clear from the drawings whether scour protection was placed, but this is on deep foundations. (AHB who visited the site remembers some rock at the base of the vertical abutment and it was clearly minimized.)

**Garrard Ck. at Forrest Rd in Greys Harbor Co. 2011. Complies with V. 5 WAC**



This bridge crosses a medium sized creek that is fully incised into a filled glacial valley. The surrounding ground is rarely flooded and Q100 is contained mostly within banks. Flood flows and channel morphology are largely unaffected by the crossing which spans bank to bank.

(3)(b) The channel is unaffected by crossing design and the cross section is stream-like.

(4) (a) The bridge span is from bank to bank and debris should pass unaffected. Clearance is low at the 100-year flood elevation (see 4g) which is not ideal but acceptable.

(4) (b) All bridge elements outside OHW

(4) (c) The stream is confined and modeling indicates a velocity ratio of 1.0.

(4) (d) No lateral movement expected.

(4) (f) Clearance was carefully calculated and reduced to 1 ft because of the small size of the stream, low gradient, limited debris loading and low velocity.

(4) (g) No protection was proposed.

### Mormon Ditch at Hampton Rd in Whatcom Co. 2009. Complies with V. 5 WAC



This bridge crosses a floodplain channel that carries not only stream flow but also flood water from the Nooksack River. The bridge fully spans bank to bank. The right bank ground slopes up and away from the floodplain. On the LB side the road is at the floodplain elevation and flood flow can go across it unimpeded. The approximate width of the channel is 40-50 ft, although this is an artificial channel dug to optimize farming. The clear span is about 120 ft.

(3)(b) The channel cross section is artificial and is maintained through the crossing. A more natural or alluvial channel cross section would be anomalous in the several thousand feet of maintained artificial channel that is not under the control of the crossing owner.

(4) (a) There is plenty of width for the passage of debris. Clearance is low but likelihood of debris is also low considering that there is farmland u/s.

(4) (b) All bridge elements are outside OHW.

(4) (c) The span exceeds the width from top-of-bank to top-of-bank and it is unlikely to be a significant increase in velocity given the minimal blockage cause by the bridge and the left bank approach fill.

(4) (d) This artificial channel is unlikely to move laterally.

(4) (f) Only 1 ft of clearance is provided for stream flow, but floods will flow deeply over this area. In these flood plain crossings there is a balance to be made between raising the road to increase clearance and the increase in approach fill in the floodplain.

(4) (g) No rock protection is shown on these plans.

**X Elk R. at Schmid Rd in Greys Harbor Co. 2008. Incomplete information but is likely to comply with V. 5 WAC**



This 36 ft bridge crosses a highly altered system, considered a “drainage ditch from cranberry bogs.” Historically this area was wetland behind the dunes on the Pacific coast that has now been drained for residential and agricultural use. This bridge spans the artificial channel from bank to bank. Minimal information available and we have not looked further into it.

(3)(b) The project maintains the character of the artificial channel.

(4) (a) Debris is not anticipated and channel-spanning structure would likely pass what did.

(4) (b) All bridge elements landward of OHW as shown on plans.

(4) (c) The channel does not have a floodplain but the velocity ratio is likely to be close to 1.0 because the waterway area under the bridge is similar to the channel up and downstream.

(4) (d) This channel cannot move laterally.

(4) (f) The 100-year flood elevation is not shown, clearance not known. Considering the requirements of the roadway it could not be raised to allow any more clearance.

(4) (g) The bridge is pile-supported. No scour protection shown on plans.

**Tahuya R. at Belfair-Tahuya RD in Mason Co. 2010. Does not comply with V.5 WAC**

This is one of the permits that were denied and appealed that led to the development of the bridge guidelines and these proposed changes to the WACs. This 116 ft bridge crosses a medium sized gravel-rich river. The clear span is about 110 ft and a width between abutments of 75 ft. The BFW was measured at 110 ft, the active channel is 150 to 200 ft, and the average top width at 100-year flood from hydraulic modeling was 364 ft. From this data the floodplain utilization ratio is 3.3, which makes this river confined, but it could also be considered unconfined (the criteria is 3.0). If this was to be designed using Water Crossing Design Guidelines (WDFW, 2013) criteria for confined channels it would be at least 35 ft longer. On the other hand, if it were to be designed using the unconfined velocity ratio, it would pass, although there is reason to doubt the model results and compliance would be carefully reviewed.

(3)(b) This channel has a wide active width and under this provision we would expect the bridge cross section to accommodate at least part of it. The rip rap abutments are part of the cross section and would therefore limit any lateral movement. If this bridge were to be permitted under the Version 5 provisions, we would ask the applicant to determine if there would be measurable impacts (coarsened or scoured bed, upstream or downstream effects, and lateral constraint). There is 0 skew and this bridge does not alter the main channel streamlines, so it may be difficult to determine the effects on the bed or banks.



(4) (a) There is quite a bit of wood in the Tahuya River and logs to 100 ft long were measured in a jam upstream of this crossing. The width between abutments is only 75 ft and there is potential for debris blockage.

(4) (b) The abutment protection protrudes into the OHW. The exemption doesn't apply since the channel is in the unconfined category.

(4) (c) This river does not have a wide floodplain in this reach, although the velocity ratio may apply. The left bank fill could have been removed to increase the length of the bridge and that alternative should have been evaluated in the design.

(4) (d) There is lateral movement of the banks in the Tahuya, primarily from log jams and from deposits of sediment, but not from meander migration in the pure sense. The design should have considered the active channel width in alternative analysis.

(4) (f) Clearance is 2.6 ft, which is probably adequate for this river.

(4) (g) Substantial abutment protection is used on this bridge because it constricts the channel. The foundation could have been designed to resist lateral load and the pile cap function as a vertical abutment to increase width between toes and reduced the quantity of rip rap used to protect them. This alternative could have brought this bridge into compliance with these rules without a substantial increase in cost.

## **V.5 WAC provisions used in this analysis**

### **(3) PERMANENT WATER CROSSING STRUCTURES - GENERAL**

b) Water crossing structure must be designed to avoid and minimize measurable impacts to the expected channel functions and processes found at the site, or mitigate for impacts to them. The department will make an exception where there are human-made features in the floodplain that are outside the control of the applicant and they are unlikely to be removed. By complying with the provisions under subsections (4) and (6) of this chapter the applicant is assumed to provide these processes and functions.

### **(4) BRIDGE DESIGN**

a) The bridge must pass water, ice, large wood and associated woody material and (a) sediment likely to move under the bridge during the one-hundred year flood flows or the design flood flow approved by the department.

b) The waterward face of all bridge elements that may come in contact with waters of (b) the state, including but not limited to abutments, piers, pilings, sills, foundations, aprons, wing walls, and approach fill must be landward of the OHWL. The requirement excludes mid-channel piers and protection required at the toe of the embankment in confined channels.

c) A bridge over a watercourse with an active floodplain must have a span wide enough to prevent a significant increase in the main channel average velocity (a measure of encroachment). This velocity must be determined at the one hundred-year flood flow or the design flood flow approved by the department. The significance threshold should be determined by considering bed coarsening, scour, backwater, floodplain flow and related biological and geomorphological effects typically evaluated in a reach analysis.

d) A person must design the bridge to account for the lateral migration expected to occur during the bridge's lifespan. The Department may approve encroachment into the expected pathway of lateral migration if it can be shown to avoid or minimize impacts to fish and their habitat.

e) Where there are existing flood control levees at the bridge construction site, or (e) other infrastructure that is not the property of the bridge owner but would constrain the construction of a bridge,

the department may approve a shorter bridge span than would otherwise be required to meet the requirements in this section.

f) The design must have at least three feet of clearance between the bottom of the bridge structure and the water surface at the one-hundred year peak flow or engineering justification for sufficient clearance that allows for the free passage of anticipated debris.

g) The bridge design must avoid the need for scour protection. Where mid-channel piers are necessary, design them so no additional scour protection is required. If scour protection is unavoidable, the design must minimize the scour protection to the amount needed to protect piers and abutments. The design must specify the size and placement of the scour protection so it withstands expected peak flows.