City of
Bellevue

MEMORANDUM

DATE: July 21, 2010

TO: Chair Ferris and Members of the Planning Commission

FROM: Michael Paine, Environmental Planning Manager, 452-2739
Heidi Bedwell, Associate Planner, 452-4862
David Pyle, Senior Planner, 452- 2973

SUBJECT: Shoreline Master Program, Topic Discussion Residential Piers, Docks and Watercraft Lifts and New Shoreline Stabilization—Planning Commission Study Session

At the July 28th study session, staff will present policy and regulatory approaches for overwater structures (such as residential docks, piers, and boatlifts) and new shoreline stabilization (including bulkheads). To facilitate this discussion the State's Guideline requirements and the working draft policy language have been provided for Planning Commission consideration. Summary of other local jurisdiction and regulatory agencies approaches with similar regulatory responsibility has also been provided.

The memo also highlights outreach with construction industry representatives and identifies general citizen concerns articulated to date. Previously presented information regarding impacts associated with overwater structures and shoreline hardening are detailed in the context of regulatory approaches presented for Commission discussion. At this study session, staff is requesting direction from the Commission on policies and general standards for residential overwater structures (piers and docks) and for the treatment of new shoreline stabilization.

Commission work will continue in September. A public hearing on a draft recommended SMPis tentatively scheduled to occur in November. Before turning to the current topics of discussion, staff has first provided a brief summary of the discussion that occurred before the Commission on July 14th.

SUMMARY OF PLANNING COMMISSION DISCUSSION AT JULY 14TH MEETING

At the July 14 study session, staff from the Utilities Department provided a presentation on Phantom Lake including the City's past and current management actions and involvement with community members to address water quality and lake elevation issues. The briefing was provided for informational purposes to the commission and public in response to questions raised during ongoing review of the Shoreline Master Program Update. Commissioners acknowledged the complexity of issues and encouraged the engagement of Phantom Lake residents with City Utilities Department staff to address their concerns in another forum given that most of these issues are outside the scope of the SMP update.

BACKROUND REGARDING OVERWATER STRUCTURES AND BULKHEADS

Piers, docks, watercraft moorage, and bulkheads have been regulated activities since the adoption of Bellevue's original SMP. Prior to 2006, residential overwater structures had a required 12 foot setback from the side property line unless an agreement with the neighbor was filed allowing a structure to be located closer to the property line. Length was limited to 80 feet or 10 feet of water depth not to exceed 150 feet. Height of structures could not exceed 16 feet and boatlifts no greater than 30 inches above OHWM.

Bulkheads have traditionally been allowed in the City's SMP, although approval of bulkhead construction has always been limited to the protection of existing areas or facilities landward of the OWHM. Bulkheads or shoreline stabilization have never been allowed for the purposes of creating land or the extensive leveling of land by filling behind the bulkhead or stabilization structure. Historically, construction or improvements to bulkheads could not extend into lakes or streams beyond the OHWM except for approved landfills. Height of structures was limited to 30 inches from average grade and a specific allowance was given up to 45 inches when there was no negative impact on abutting properties and it was necessary to protect upland property because of extraordinary height or slope of the property. Finally, standards required bulkheads be designed to minimize transmission of wave energy to other properties.

SUMMARY OF THE SHORELINE MANAGEMENT ACT AND WAC GUIDELINES

Several sections within the State Shoreline Master Program Guidelines' rules (Rules) address standards and requirements for piers and docks and shoreline stabilization. In addition to the standards for environment designations in WAC 173-26-211, WAC 173-26-231 pertains to shoreline modifications which include general principles applicable to all shoreline modification, specific provisions for shoreline stabilization (including bulkheads), and piers and docks (see Attachment 1 for full reference).

The "aquatic environment" designation policies limit new over-water structures to water-dependent uses, public access, or ecological restoration; limits new structures to the minimum size necessary, and encourages multiple use facilities to reduce impacts. Development should be located and designed to minimize interference with surface navigation, consider public views, and allow safe unobstructed passage of fish and wildlife, particularly those dependent upon migration (such as migratory fish species). Additionally, uses and modifications should prevent degradation of water quality and altering of natural hydrographic conditions.

The Rules for new piers and docks make the allowance only for water-dependent uses or public access. A dock associated with a single-family residence is a water dependent use, provided that it is designed and intended as a facility for access to watercraft and complies with SMP provisions. Pier and dock construction shall be restricted to the minimum size necessary to meet the needs of the proposed water-dependent use. The Rules also suggest development of two or more dwellings provide joint use or community dock facilities, when feasible, rather than allow individual docks for each residence. Piers and docks should be designed and constructed to avoid or, if that is not possible, to minimize and mitigate the impacts to ecological functions, critical areas resources. Master programs should require that structures be made of materials that

have been approved by applicable state agencies.

The standards for shoreline stabilization are perhaps the most prescriptive of all elements in the Rules. The Rules acknowledge that "Shorelines are by nature unstable, although in varying degrees. Erosion and accretion are natural processes that provide ecological functions and thereby contribute to sustaining the natural resource and ecology of the shoreline. Human use of the shoreline has typically led to hardening of the shoreline for various reasons including reduction of erosion or providing useful space at the shore or providing access to docks and piers. The impacts of hardening any one property may be minimal but cumulatively the impact of this shoreline modification is significant" (WAC 173-26-231(3).

The Rules go on to describe where shoreline alterations are deemed necessary to protect single-family residences and principal appurtenant structures in danger from active shoreline erosion. Under the obligation to implement the Shoreline Management Act (SMA) and avoid or mitigate adverse impacts to shoreline ecological functions, master programs should include rules defining circumstances where alteration of the shoreline is allowed. Additionally, when allowed the rules must include preferred design and type approaches. The Rules are very specific for new structural stabilization measures and the conditions necessary to demonstrate their need. Detailed criteria is provided for: protection of existing primary structures, support of new nonwater-dependent development, including single-family residences, support of water-dependent development, and protects projects for the restoration of ecological functions or hazardous substance remediation projects.

The Rules permit existing stabilization structures to be "replaced with a similar structure if there is a demonstrated need to protect principal uses or structures from erosion caused by currents, tidal action or waves". Replacement is defined by the WAC as "the construction of a new structure to perform a shoreline stabilization function of an existing structure which can no longer adequately serve its purpose. Additions to or increases in size of existing shoreline stabilization measures shall be considered new structures" (WAC 173-26-231(3)(a)(iii)(C)).

When stabilization measures are necessary, the Rules emphasize nonstructural methods including building setbacks, relocation of structures to be protected, groundwater management, and planning and regulatory measures to avoid the need for structural stabilization. The rules provide a preference for soft stabilization measures because generally the harder the construction measure the greater the impact on shoreline processes. A discussion of shoreline processes and impacts to processes is provided later in this memo. Soft structural measures rely on less rigid materials, such as biotechnical vegetation measures or beach enhancement. There is a range of measures varying from soft to hard that include:

- Vegetation enhancement;
- Upland drainage control;
- Biotechnical measures;
- Beach enhancement;
- Anchor trees;
- Gravel placement;
- Rock revetments;

- Gabions;
- Concrete groins;
- Retaining walls and bluff walls;
- Bulkheads; and
- Seawalls.

In both new and replacement structures, "soft approaches shall be used unless demonstrated not to be sufficient to protect primary structures, dwellings and businesses" (WAC 173-26-231(3)(E)). It is important that the Commission refer to the excerpted section from the Rules (WAC 173-26-231(3)(E)) because of the specificity and direction provided in this section.

POLICY GUIDANCE FROM WORKING DRAFT SMP

The SMP working draft presented to the Commission at the May 12th, 2010 study session continues to be our starting point for policy and regulatory discussion. As with the policies for structure setbacks, the working draft policies for docks/piers and stabilization generally reflect the concept of minimizing impacts on ecological function while allowing some flexibility for alternative development based on site conditions. In addition to the environment designation criteria that establishes how shoreline modifications are treated in the aquatic environment, the following is an excerpt of relevant working draft policies to consider when discussing the regulatory options for this topic:

5.B.1.b. General Shoreline Modification Policies

POLICY SH –192. Assure that shoreline modifications, individually and cumulatively, do not result in a net loss of ecological functions.

POLICY SH –193. Shoreline modification actions should first avoid, and when avoidance is not technically feasible, minimize ecological impacts.

POLICY SH –194. Only allow shoreline modifications when in support of an allowed use or activity.

5.B.8.b. Pier and Dock Policies

POLICY SH-224. Allow for maintenance, repair, and reconfiguration of existing functional and legally established piers and docks.

POLICY SH-225. Provide incentives and flexible alternatives for dock and pier construction and maintenance to protect the near shore while allowing maximum flexibility to the dock and pier user.

POLICY SH-226: New pier and dock construction should be restricted to the minimum size necessary to meet the needs of the proposed water-dependent use.

POLICY SH-232: New covered moorage, boathouses, or other covered and enclosed moorage shall be prohibited, with the exception of boat canopies.

POLICY SH-233. Allow minor maintenance and repair of existing covered moorage, boathouses, or other covered and enclosed moorage.

POLICY SH-234: Consider tailored standards for docks and piers on Phantom Lake and in the Shoreline Residential Canal (SRC) district that address the unique characteristics of those areas.

5.B.2.b. Shoreline Stabilization Policies

POLICY SH-195. Allow for new hardened stabilization as the least favored alternative and only when no technically feasible alternative to avoidance and softened stabilization exists.

POLICY SH-197. Promote through incentives the use of soft shoreline stabilization measures or other measures that incorporate innovative habitat restoration techniques.
POLICY SH-198. Existing legally established shoreline stabilization measures requiring replacement are presumed needed to protect existing shoreline uses and may be replaced provided that, at a minimum, non-vertical structural shoreline stabilization is used; however, soft structural shoreline stabilization is preferred.
POLICY SH-199. When a vertical or near-vertical bulkhead no longer adequately serves its purpose, the bulkhead may be replaced; provided that replacement with a new vertical bulkhead is prohibited unless replacement with a non-vertical structure is technically infeasible.
POLICY SH-200. Existing vertical and near-vertical bulkheads supporting the artificial canals in the Shoreline Residential Canal environment may be repaired or replaced in their current configuration and design.
POLICY SH-201. Allow maintenance and repair of shoreline stabilization structures; provided that no expansion of the structure is allowed. Repair shall not include full replacement of a shoreline stabilization structure that can no longer adequately serve its purpose.
POLICY SH-203. Recognize the unique physical conditions of Phantom Lake and discourage shoreline stabilization measures.

During the July 28, 2010 meeting, staff will review these policies with the Commission as an introduction to the regulatory discussion presented below. When a regulatory approach is agreed upon, policies will be edited to reflect the regulatory concept the Commission supports as a result of their discussion and comments received. Included with this memorandum is a complete excerpt from the relevant sections of the SMP working draft related to residential overwater structures and shoreline stabilization as Attachment 2.

COMMENTS

Construction Industry Comments

In an effort to identify feasible regulatory approaches which could be constructed and meet the needs of users, staff met individually with representatives from four different permitting and construction companies who are experienced in both the construction and permitting of shoreline structures. In their role as facility designers and permit advocates, many of these individuals are technical experts, have a high exposure to citizen needs, have worked in multiple jurisdictions, and have a good understanding of different agency requirements which makes their feedback to staff invaluable. During the meetings, staff presented a proposed new dock standard (for a new dock), dock reconfiguration standards, and dock repair standards. Additional discussion was focused on technical components of dock construction. The approaches presented later in this memo reflect their feedback emphasizing flexibility to configuration and materials, responsiveness to physical conditions, and compatibility with state and federal standards.

Citizen Comments

At prior Commission meetings and through written comment received, citizen input related to these discussion items was reviewed. Comments received to date have highlighted the following general issues:

Preserve ability to maintain existing structures (docks/piers, bulkhead etc)
Generally, a Substantial Development permit is required for all development and associated activity within the shoreline jurisdiction. Specific items are identified as exempt from the

shoreline substantial development permit requirements including normal maintenance and repair. *WAC 173-27-040(2)(b*: "Normal maintenance or repair of existing structures or developments, including damage by accident, fire or elements. 'Normal maintenance' includes those usual acts to prevent a decline, lapse, or cessation from a lawfully established condition. 'Normal repair' means to restore a development to a state comparable to its original condition, including but not limited to its size, shape, configuration, location and external appearance, within a reasonable period after decay or partial destruction, except where repair causes substantial adverse effects to shoreline resource or environment. Replacement of a structure or development may be authorized as repair where such replacement is the common method of repair for the type of structure or development and the replacement structure or development is comparable to the original structure or development including but not limited to its size, shape, configuration, location and external appearance and the replacement does not cause substantial adverse effects to shoreline resources or environment."

As noted by representatives of the WSSA group, state law also describes certain actions which may be exempt from Shoreline Substantial Development permit. Per WAC 173-27-040 Exempt activities are not required to obtain a substantial development permit (SDP), *however*, exempt projects **must still comply with all development standards**; i.e., setbacks and other regulations in the Shoreline Master Program and these activities may still require other City permits such as building and clearing and grading. Although considered as exempt under WAC 173-27-040, many projects requiring additional state or federal permitting do require application for and issuance of a Letter of Shoreline Exemption (WAC 173-27-050). Additionally, the WAC gives local governments authority to condition the approval of exempted developments and/or uses as necessary to assure consistency of the project with the Act and local master program.

Suggested policy and regulatory concepts are discussed below which respond to this concern. Normal maintenance and repair is to be encouraged. However, when a structure has not been maintained over time and the intended function of the structure is no longer intact, then the provisions for repair and maintenance do not apply. This circumstance would be covered by standards established for nonconforming development and are not in conflict this exemption allowance. The City has the authority to establish nonconforming development and identify appropriate measures to meet the goals and policies of the SMP.

Deference should be given to other permitting agencies

Updated SMP's are required to meet a standard of no net loss of ecological functions. It is important to understand that local governments cannot depend on the regulatory authority of other independent resource agencies to satisfy the no net loss requirement. In other words, regulations outside of the control of local governments cannot be relied upon to satisfy SMP requirements. Local governments lack legislative authority to dictate how outside resource agencies review shoreline projects or whether future changes to regulations are made. Many of the resource agencies have very different regulatory obligations that can sometime overlap.

Fully developed condition of shorelines should be considered

The City's Shoreline Analysis report acknowledges the impact that existing development has on ecological functions of the shorelines. Certainly the current conditions do not function as a natural shoreline and it is neither the State's nor the City's intention to restore the current shoreline to an entirely natural state. Although many of the functions have been altered or diminished they have not been entirely eliminated nor have the opportunities to approximate functions found in a natural condition. Potential rules and policies should acknowledge the differing site conditions and circumstances and opportunities to retain existing functions and enhance where feasible.

In addition to these comments we have provided in Attachment 3, comments received from Ecology staff since the last Commission meeting.

OTHER JURISDICTIONS' APPROACHES

As with setback standards, staff has reviewed several local jurisdictions standards pertaining to docks/piers, watercraft lifts and shoreline stabilization. Excerpts from their standards are included in Attachment 4. The following is a summary of the general approaches taken:

Redmond: New docks/piers are limited to a maximum of 480 square feet. Length is limited to the lesser of 80 feet, or a length necessary to reach a water depth at the end of the pier of 13 feet below OHW. Minimum setback from side property line is 10'. Also there is a 25' separation from another pier or dock or the maximum distance possible from any adjacent dock or pier, whichever is less. Maximum width is no greater than 6 feet. Decking designed to allow 50% light passage- options: grated deck, light prisms or other means. Prohibited elements: Finger piers supported by piling; skirting, decking lower than one vertical foot above OHW or similar structures around docks and floats; and floating homes.

Kirkland Standards closely follow the US Army Corps of Engineer standards in their Regional General permit. Maximum area is 480 sq. ft. for single property owner. Required setback from side property lines 5 ft for moorage pile; otherwise 10 ft. Maximum length 150 ft, but piers or docks extending further waterward than adjacent piers or docks must demonstrate that they will not have an adverse impact on navigation. Other limits include: 26 ft. for ells and 20 ft. for fingers and float decking attached to a pier. Maximum width is specified at 4 ft. for pier or dock, 6 ft. for ells, 2 ft. for fingers, 6 ft. for float decking attached to a pier, must contain a minimum of 2 ft. of grating down the center of the entire float. For piers or docks with no ells or fingers, the most waterward 26 ft. section of the walkway may be 6 ft. wide. Piers and docks and platform lifts must be fully grated or contain other materials that allow a minimum of 40% light transmittance through the material. When a proposal is approved by the Corps and WA Fish and Washington Department of Fish and Wildlife (WDFW), the dock/pier may vary from City requirements so long as minimum standards for area, length and width are met.

Replacement of existing piers must meet the dimensional and design standards for new piers, but can be administratively approved for the following alternative design features: Increased pier area, but no larger than existing pier; Max. 26 ft. length for fingers and float decking attached to a pier; Max 8 ft. width for ells and float decking attached to a pier. Boatlifts and Canopies are limited to 1 boatlift and 2 jet ski lifts per dwelling unit; 1 boatlift canopy per detached dwelling

unit. Canopies must be translucent. Top of canopy no more than 7 feet above the pier and lowest edge of canopy at least 4 feet above OHWM.

Sammamish Maximum area is 600 square feet and at least 15 feet from property line. Dock length is limited to 80 feet maximum or length necessary to reach a depth of 8 feet. No dock shall be more than ¼ the distance to the opposite shoreline. Dock width is up to 50% of lot width. New private docks, floats and/or lifts (lifts allowed on Lake Sammamish only) shall be designed and constructed using WDFW-approved methods and materials. Existing legally established private docks and floats may be repaired and maintained. If repair or maintenance of a non-conforming dock chances the location of the structure or alters any dimension of the structure by more than 10%, it shall be subject to the regs for new docks.

OTHER REGULATORY AGENCIES AND REQUIREMENTS

In addition to the local jurisdiction role in regulating these activities, other state and federal agencies have regulatory authority governing activities happening in the water. Representatives from all of these regulatory agencies were part of the agency panel discussion before the Commission in December 2009.

Department of Natural Resources (DNR) Aquatic Use Authorization The public owns much of the land under water and the DNR has authority to manage these areas. Approval is needed if the land intended to be used is state-owned.

United State Army Corps of Engineers The Corps evaluates applications for permits for proposed activities in "Waters of the United States" (including wetlands) throughout the State of Washington under the authorities of Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and the Marine Protection, Research and Sanctuaries Act. What this means is that any person proposing to do an activity which would affect the waters of the United States is required to receive appropriate permits from the Corps.

Under the Corps authority they can issue a regional general permit for certain categories of activities. A regional general permit (RGP) is a Department of the Army authorization that is issued on a regional (limited geographic scope) basis for a category of activities when those activities are substantially similar in nature and cause only minimal individual and cumulative impacts on the aquatic environment. Each RGP has a number of terms and conditions that must be met in order for an applicant to use an RGP. In most instances, anyone complying with the terms and conditions of an RGP may receive project specific authorization. The Corps has issued two RGPs relevant to dock/pier and boatlift installation. They are referred to RGP 1 and RGP3 (See Attachment 5). RGPs are issued with the intent of protecting the environment and endangered species and providing a streamlined prescriptive approach to meeting their requirements. Work that does not comply with RGP standards may require permit authorization by a standard individual permit. Both of these permits have expired and are no longer in use by the Army Corp. There are no immediate plans to reissue the RGP; however, there are plans to issue a programmatic ESA consultation instead of reissuing the RGP. Once completed, this will help to streamline the permit review process. These standards were consulted as part of the prior

code update in 2006 in an effort to better align local regulatory standards with other permitting requirements.

WA Department of Fish and Wildlife WDFW has the responsibility of preserving, protecting and perpetuating all fish and shellfish resources of the state. Their authority comes from the state law known as the "Hydraulic Code". WDFW has specific requirements for structures in or near water through their Hydraulic Permit Approval (HPA). Any form of work that uses, diverts, obstructs, or changes the natural flow or bed of any fresh water or saltwater of the state requires an HPA. Mitigation measures for piers, docks, floats, rafts, ramps, and associated moorings include restrictions on structure width and/or incorporation of materials that allow adequate light penetration (i.e., grating).

This is information provided to highlight the complex and sometimes overlapping regulatory obligations. Regulatory provisions presented are done so with these other agency standards in mind but with the intention of meeting the requirements of the SMP Update. As noted in the public comment section of this memo, although there may be overlap in some areas, each of these agencies has distinct and separate legal obligations which do not apply to the SMP.

IMPACTS TO ECOLOGICAL FUNCTIONS FROM OVERWATER STRUCTURES AND SHORELINE HARDENING

As presented to the Planning Commission during the science and agency panel discussions held in the fall of 2009, and as documented in published scientific studies provided to the Commission in hard copy and on the project website, shoreline communities such as those along Lake Washington, Lake Sammamish, and Phantom Lake are situated within natural landscapes abundant in ecological wealth and are host to a wide range of functions and processes.

The values these resources provide to the community often support the quality of life sought by citizens who choose to build their homes along the shoreline. For this reason, a community's ability to achieve a balance between the intensity of development and the retention of the natural systems in which the community is located is vital to preserving the long term value of those shorelines.

In an effort to balance the community's desire to develop property for various uses while preserving and, where possible, enhancing the natural landscape and quality of life for all users of the lakes, staff have developed a working draft of moorage and stabilization standards that balance both the community's interest in the continued use and development of the shoreline and the State's interest in preserving shoreline resources that make the City's shorelines a valuable and preferred location to live and recreate for many residents.

Over the course of the development of this SMP, staff have provided the Commission with a number of documents and presentations on shoreline science. Documents provided to date have included:

1) The 2006 GMA Best Available Science document for critical areas (including the Shoreline Area) and the Critical Areas Risk Analysis (which assessed overall risk to ecological functions from two alternatives—and no action).
2) A specific study produced by the City of Bellevue and titled *A Summary of the Effects of Bulkheads, Piers, and Other Artificial Structures* and *Shoreline Development on ESA-listed Salmonids in Lakes* commissioned by the city following the 1999 ESA listing of Puget Sound Chinook.
3) Department of Fish and Wildlife publication titled *Land Use Planning for Salmon, Steelhead and Trout: A Land Use Planner's Guide to Salmonid Habitat Protection and Recovery.*
4) Numerous studies and publications to the project website, including several studies related to the impacts of docks and bulkheads on shoreline ecosystems.

In addition, staff has organized and delivered presentations to the Commission from:

1) Dan Nickel of the Watershed Company provided a basic conceptual model describing the changes to aquatic habitat and ecosystem functions brought about by urban development.
2) Tessa Francis of NOAA presented a brief overview of her research on the effects of shoreline urbanization and aquatic ecosystems.
3) US Fish and Wildlife researcher Roger Tabor presented results from his 14 years of research in the Lake Washington basin. Recent projects presented included movement patterns of Chinook salmon smolts, smallmouth bass, and northern pike minnow; nearshore habitat use of juvenile Chinook salmon in lakes; predation of juvenile sockeye salmon and Chinook salmon by predatory fishes; and distribution, habitat use, and diet of freshwater sculpin.
4) Jose Carrasquero, a Principal Scientist with Herrera Environmental Consultants, with 21 years of experience in the Puget Sound region and Jeff Parsons, a coastal geomorphologist with more than 15 years of both applied and research experience. Mr. Carrasquero and Dr. Parsons presented information on physical habitat forming and ecological processes as well as the life history and biological requirements of target species.

In addition to staff organized presentations, WSSA has provided a presentation to the Commission that included commentary by Dr. Pauley, a trained fisheries expert and research scientist. Dr. Pauley's presentation provided context to the extensive range of habitat utilized by migratory fish populations, reviewed various life cycle requirements for different fish populations, and identified specific habitat requirements and predation issues associated with Bellevue shorelines.

It is generally recognized that shoreline ecosystems are highly productive systems due to the convergence of energy and materials that pass through shorelines in high volumes. Shorelines are unique physical environments –because the water meets the land. This convergence of water and land results in ecological functions, which are defined as physical, biological, and chemical interactions that take place in various settings within an ecosystem. Generally integrated with one another, functions are comprised of a series of processes that, when performed without interruption, cumulatively provide a net benefit to the ecosystem or a "function". That is, functions are comprised of a series of processes the result of which is the valuable natural landscape that we know as the shoreline.

Shoreline functions can be broken down into two essential categories – longitudal and transverse. Transverse functions typically occur in a perpendicular fashion as compared to longitudal functions. Transverse functions occur across the "riparian" area and provide a high level of nutrient and sediment input from the upland in to the shoreline ecosystem. Longitudal functions include those ecological interactions and processes along the shoreline that depend on the flow of materials and are the result of energy and patterns that move nutrients and materials along the shoreline in a longitudal fashion. Longitudal functions provide much of the energy and mechanical processing essential to shoreline processes. Coupled together, these longitudal and transverse functions and the different inputs they provide make up the shoreline ecosystem. Without one or more elements required for the completion of processes, functions are not provided or are provided at a diminished level.

Commonly referenced and identified in WAC Chapter 173-26-201(3)(d) functions that occur within the shoreline ecosystem are as follows:

Habitat Functions
• Physical space and conditions for life history
• Food production and delivery

Hyporheic Functions
• Removing excess nutrients and toxic compounds
• Water storage
• Maintenance of base flows
• Support of vegetation
• Sediment storage

Vegetative Functions
• Temperature regulation
• Water quality improvement
• Attenuating wave energy
• Sediment removal and bank stabilization
•Large woody debris (LWD) and organic matter recruitment

Hydrologic Functions
• Storing water and sediment
• Attenuating wave energy
• Attenuating flow energy
• Removing excess nutrients and toxic compounds
• Recruitment of LWD and other organic material

Process interruption and impact to shoreline function The lands and waters along Bellevue's shorelines are home to fish nursery areas, spawning areas, and other habitats. Many shoreline plants provide food and nesting materials for waterfowl and other wildlife. Shoreline plants provide protection against erosion and flood damage by slowing down the wave action that comes from storms or boat traffic. The nutrients and decayed plant material that shoreline plants produce also contribute to the productivity of this environment. Some of the reaches of shoreline

within Bellevue's jurisdiction function much like wetlands and trap debris and excess nutrients maintaining the system's balance protect nearby developments from flooding and erosion.

Interruption to ecological processes and functions can come in many forms. In a developed urban environment process interruptions are most commonly the result of a modified landscape and the accompanied ongoing activity. Interruptions along the shoreline typically occur in the form of a structural modification or improvement that alters, limits, or otherwise precludes the completion or continuation of a process. In addition, permanent landscape modifications with hardened facilities often eliminate the possibility of reclaiming disturbed areas through ecological succession, which is the ecosystems own method of "mitigating" impacts from changes and disturbance. In many cases, absent succession, landscape modifications directly interrupt ecosystem processes by impacting the cross landscape connections and inputs through the location of a physical barrier or obstruction, such as a bulkhead, patio, driveway, or even a manicured lawn. In other cases landscape improvements indirectly impact processes by influencing or altering the inputs and therefore the outputs of a process.

Impacts of docks, piers, moorage, and boatlifts on shoreline functions Docks, piers, moorage, and boatlifts are modifications of the shoreline that can interrupt processes and impact shoreline ecosystem functions. Overwater structures primarily impact longitudal functions related to longshore processes and exchanges, although docks can impact both longitudal and transverse functions. Primary impacts from docks on shoreline ecosystem functions include impacts to plant health and productivity, obstruction of light by shading, increased predation on sensitive fish populations, impacts from the storage of boats and associated traffic, and impacts to the transport of sediments and sedimentation. Specific impacts are as follows:

- Short-term construction impacts such as pile driving and increased turbidity
- Chronic impacts from storage of boats, boat maintenance, associated foot traffic, and impacts from boat use.
- Piers, piles, boatlifts, and moored boats may provide cover, shade, and focal points for exotic predators of juvenile chinook and coho salmon such as smallmouth bass and largemouth bass.
- Shading from piers, boat canopies, boathouses, and moored boats may reduce the abundance of prey organisms available to juvenile chinook and coho salmon, and to forage fish such as bull trout by reducing aquatic vegetation and phytoplankton abundance. Any reduction in aquatic vegetation may also reduce complex refuge habitat.
- Piers and/or bulkheads may disrupt the migratory and rearing behavior of juvenile chinook and coho salmon.
- The boating activity that accompanies piers could disturb rearing or migrating chinook and coho salmon.
- Chemicals used to preserve or clean wood structures, and hydrocarbons from boats and personal watercraft could be acutely or chronically toxic to chinook and coho salmon, bull trout, or prey organisms of those species.
- Pier lighting may facilitate nocturnal predation on juvenile chinook and coho salmon by visual predators like smallmouth bass, cutthroat trout, and piscivorous birds.
- The permanent removal of woody debris during pier construction reduces the availability of complex refuge habitat for small fish, and attachment surfaces for periphyton.

While all of these issues are observable, some are documented through past study and publication while some have not been extensively studied and there is little to no literature available. In researching freshwater dock and pier standards for waters that provide habitat for anadramous and resident fish populations, staff identified a recent study published by the Army Corps of Engineers and US Geological Survey titled *Minimizing Effects of Over-Water Docks on Federally Listed Fish Stocks in McNary Reservoir; A Literature Review for Criteria.* This published literature review provides a summary of science available on impacts of docks to fish habitat and predator-prey relationships and is available as Attachment 6. The document identifies numerous regulatory standards (such as walkway width, dock depth and location, and grating) intended to benefit shoreline functions that are supported by specific pertinent evidence and research, although the document does identify areas where there is inconclusive science in support of a proposed standard. This literature review and it's findings, in addition to the previously presented science, was used in developing proposed dock standards. Generally, impacts from docks can be addressed through simple, effective, and flexible dock and pier standards. Proposed dock, pier, moorage, and boatlift standards are identified in detail below.

Impacts of bulkheads, shoreline stabilization, and retaining walls on shoreline functions
Shoreline stabilization measures, bulkheads, and retaining walls come in various designs and are installed for various reasons that depend on the site's physical constraints and the property owner's objective. Historically, stabilization measures have been limited to hardened structures designed to withstand the erosive forces of mechanical weathering. Few of the historically constructed bulkhead features along Bellevue's shoreline have incorporated features intended to retain shoreline ecological function. These structures have impacted shoreline functions by serving as a physical barrier to transverse shoreline processes, and in some cases amplifying longitudal process through deflection of energy. Shoreline hardening typically results in adverse impacts to shoreline ecological functions such as:

- Bulkheads prevent the recruitment of native sediment to the lake, resulting in a loss of heterogeneous substrate, and resulting in shoreline erosion at the toe or along the shore downwind of the bulkhead. This could affect the availability of spawning and rearing habitat, and the forage base for a variety of fish species.
- The removal of vegetation during bulkhead construction or replacement could eliminate a potential source of cover and food for juvenile chinook and coho salmon, and forage fish of bull trout. Vegetation that is removed is typically not replaced with native woody species that could provide a source of woody debris to the lake . Instead, shoreline property owners generally favor lawn or ornamental shrubby species that preserve lake views.
- Bulkheads eliminate shallow-water habitat, which is critical as refuge and foraging habitat for juvenile salmonids and other small fish.
- Bulkheads reflect wave energy at the shoreline, resulting in the scour of sediment at the bulkhead toe, and creating an inhospitable high-energy environment for juvenile fish.
- The permanent removal of woody debris during bulkhead and/or pier construction reduces the availability of complex refuge habitat for small fish, and attachment surfaces for aquatic plant and animals.
- Beach starvation. Sediment supply to nearby beaches is cut off, leading to "starvation" of the beaches for the gravel, sand, and other fine-grained materials that typically constitute

a beach. Habitat degradation. Vegetation that shades the upper beach or bank is eliminated, thus degrading the value of the shoreline for many ecological functions, including spawning habitat for salmonids and forage fish. Sediment impoundment. As a result of shoreline hardening, the sources of sediment on beaches (eroding "feeder" bluffs) are progressively lost and longshore transport of sediment is diminished. This loss leads to lowering of down-drift beaches, the narrowing of the high tide beach, and the coarsening of beach sediment. As beaches become more coarse, less prey for juvenile fish is produced. Sediment starvation may lead to accelerated erosion in down-drift areas.

- Exacerbation of erosion. The hard face of shoreline armoring, particularly concrete bulkheads, reflects wave energy back onto the beach, exacerbating erosion.
- Ground water impacts. Erosion control structures often raise the water table on the landward side, which leads to higher pore pressures in the beach itself. In some cases, this may lead to accelerated erosion of sand-sized material from the beach.
- Hydraulic impacts. Shoreline armoring generally increases the reflectivity of the shoreline and redirects wave energy back onto the beach. This leads to scouring and lowering of the beach, to coarsening of the beach, and to ultimate failure of the structure.
- Loss of shoreline vegetation. Vegetation provides important "softer" erosion control functions. Vegetation is also critical in maintaining ecological functions.
- Loss of large woody debris. Changed hydraulic regimes and the loss of the high tide beach, along with the prevention of natural erosion of vegetated shorelines, lead to the loss of beached organic material. This material can increase biological diversity, can serve as a stabilizing influence on natural shorelines, and is habitat for many aquatic-based organisms, which are, in turn, important prey for larger organisms.

Additionally, hard structures, especially vertical walls, often create conditions that lead to failure of the structure. In time, the substrate of the beach coarsens and scours down to bedrock or a hard clay. The footings of bulkheads are exposed, leading to undermining and failure. This process is exacerbated when the original cause of the erosion and "need" for the bulkhead was from upland water drainage problems. Failed bulkheads and walls also adversely impact beach aesthetics, and may be a safety or navigational hazard.

Shoreline stabilization, bulkheads, and retaining walls are often controversial components of shoreline development. Seen as essential by many homeowners for the protection of their homes, they are also one of the most damaging to shoreline ecosystem function. By definition a bulkhead is a solid wall erected generally parallel to and near the ordinary high water mark for the purpose of protecting adjacent uplands from waves or current action. Past survey of the City's Shorelines (known as the Bulkhead Study) included identification and documentation of structures that may be either a retaining wall or a bulkhead. Retaining walls have been included in this conversation and in past studies due to their proximity to the shoreline, possible location in the floodplain of Lake Sammamish and Phantom Lake, and their influence over shoreline functions.

REGULATORY APPROACH FOR DOCKS, PIERS, MOORAGE, AND BOATLIFTS

To understand the current status of Bellevue shoreline, a GIS analysis of existing overwater structures was conducted and revealed that Bellevue's shoreline is essentially developed in terms

of dock structures. Almost all waterfront residential properties in Bellevue have a dock, although the number is far lower on Phantom Lake. The study also revealed that most docks are shorter than 70 feet and docks on Lake Washington are generally larger than those on Lake Sammamish. Results are presented in tables 1 through 3 below.

Table 1 -Dock Width and Length

Lake	**Avg Maximum Width (ft)**	**Avg Length (ft)**	**Median Maximum Width (ft)**	**Median Length (ft)**
Washington	24.4	71.3	24.1	69.4
Phantom	11.5	42.6	10.9	42.3
Sammamish	18.3	67.6	18.7	63.5
Note: Width means the widest part of the dock				

Table 2 - Dock Size (Overwater Coverage)

Lake	**Average Dock Size (sq. ft.)**	**Median Dock Size (sq. ft.)**
Washington	733.00	641.7
Phantom	308.9	299.9
Sammamish	530.3	505.8
Note: These are the areas for Residential structures only		

Table 3 - Properties With No Dock

Lake	**Lots without Piers AND Greater Than 30' at OHWM**
Washington	20
Sammamish	26
Phantom	26
Note: Does not include commercial property or Newport Shores Residential Canal properties	

The regulatory approach offered for the Commission discussion is based on the above background information and keeps the key principles for review in mind: (1) be Bellevue appropriate; (2) should focus on neighborhood character, (3) balance regulatory interest with private property rights; (4) be predictable and user-friendly while preserving flexibility for those that want it; and, (5) take notice of citizen issues.

Typically, shoreline function is most abundant within the narrow band where the aquatic lake environment meets the upland environment (see discussion of shoreline functions above). Reflecting this higher level of shoreline function, staff identified a greater need to protect the nearshore environment and have developed draft dock and pier standards for new and reconfigured docks that divide the dock or pier facility into two sections: 1) the walkway and 2) the moorage platform. This approach provides an emphasis on protection of the nearshore and allows for enhanced flexibility in deeper water.

To develop new dock standards, five different categories of dock construction and repair are presented. Each of these categories demonstrates the different level of work proposed and reflects the existing condition of the shoreline. Generally, the objective of the new dock standards is permit predictability, simplicity, and net environmental improvement. An excerpt from the current code is provided in Attachment 7. The standards associated with each of these categories are described below.

Proposed generally applicable dock standards are as follows:

General Standards

1) **Number of Piers/Docks –** No proposed change from the current standard. One dock is allowed per shoreline frontage. This limits the total number of structures along the shoreline.

2) **Minimum Shoreline Frontage –** No proposed change from the current standard. Docks are only allowed on parcels with minimum required lot width for underlying land use district. This restriction is currently in effect and is pre 2006.

3) **Minimum Size Necessary -** Docks and Piers shall be the minimum size necessary to provide the intended water dependent function of moorage. This is in response to WAC 173-26-231 that requires pier and dock facilities be the minimum necessary to accommodate the intended function of the facility.

4) **Total Facility Length –** No proposed change from the current standard. Docks and piers shall not be longer than 150 feet in length measured from the OHWM. This restriction is currently in effect and is intended to limit affects on navigation.

5) **Dock and Pier Setback from Property Line–** New docks and replacement docks shall be set back from the property line a distance of 10 feet. This is a typical land use control and is intended to limit conflict between adjacent facilities. The required dock setback in the current standards is 12 feet. Staff suggest a reduction to 10 feet to provide additional flexibility and consistency with other zoning setback dimensions.

6) **Incentivize Joint Use Moorage –** Allow for increased dock dimensions for joint use moorage for two or more adjacent waterfront lots as a preferred alternative to individual dock construction. This concept exists in the current code and is proposed for retention in new standards although overall allowed square footage has changed.

7) **Limit the Use of Preservative Treated Materials –** Restrict the use of preservatives to label application directions and discourage use in areas of sensitivity. Give preference to materials that do not require the use of preservative treatments. This exists in the current code. No significant change is proposed. The purpose of this restriction is to limit affects of different preservatives on water quality. Many preservatives include toxic compounds and can negatively affect water quality when the label directions are not followed and not allowed to properly cure before use overwater.

8) **Skirting Prohibited** – No proposed change from the current standard. Prohibit the use of dock skirting for any portions of new docks, dock replacement, or dock repair. Skirting can increase overwater shading and can affect the flow of materials in high water conditions.

9) **Timing of Construction** – Limit the timing of construction to those times of year least impacting to aquatic habitat and migratory fish species. Use of a vibratory pile driver with wood attenuation block is preferred. Construction activity can be damaging to fish and wildlife and should be planned to have least impact possible.

10) **Habitat Protection** – No proposed change from the current standard. Design and located docks and piers to preserve existing habitat features. Many habitat features exist on Bellevue's shorelines. This restriction is intended to preserve existing features. This rule exists in the current code.

11) **Stream Outfalls** – Prohibit the construction of new or replacement of existing docks and piers within 100 feet of stream outfalls. The purpose of this proposed rule is the restriction of development around stream/lake confluence areas where higher levels of shoreline function are anticipated. This is a new rule and does not exist in the current code.

12) **Boat and Watercraft Moorage** – Restrict the moorage and storage of boats or watercraft to the moorage platform or within the first 30 feet of the OHWM for existing facilities. The purpose of this rule is to limit impacts associated with boat storage (shading), boat maintenance, and use in the nearshore area.

13) **Freestanding Boat and Watercraft Lifts** – Limit the number of freestanding boatlifts to two (2) or the total number of watercraft lifts to four (4). Two (2) watercraft lifts are comparable to one (1) boatlift. Boat and watercraft lifts shall only be located on the dock moorage platform or for existing facilities a distance of at least 30 feet measured from the OHWM. The purpose of this rule is to limit the total number of lifts connected with the lake bottom as limiting factors to aquatic vegetation growth and to prohibit the location of freestanding boatlifts in the nearshore. Fixed boatlifts are preferred to freestanding boatlifts as they do not require bottom disturbance for their placement. Current regulations limit the number of boatlifts and watercraft lifts to 1 lift. This proposed change would increase the number of allowed lifts and restrict the location to the moorage platform.

14) **Fixed Boat and Watercraft Lifts** – Limit the location of fixed watercraft lifts to the moorage platform or for existing facilities to the area of the dock or pier that is more than 30 feet waterward of the OHWM. The purpose of this proposed rule is to reduce impacts to the nearshore by limiting the long term storage and moorage of boats within the first 30 feet waterward of the OHWM. Current regulations do restrict the number of boat and watercraft lifts to one lift.

15) **Covered Moorage** – Restrict the location of covered moorage to the moorage platform or a minimum of 30 feet from OHWM for existing facilities. Restrict the number of moorage covers to one per property. Require the use of translucent materials. Current regulations limit the number and placement of moorage covers to one translucent cover within the moorage

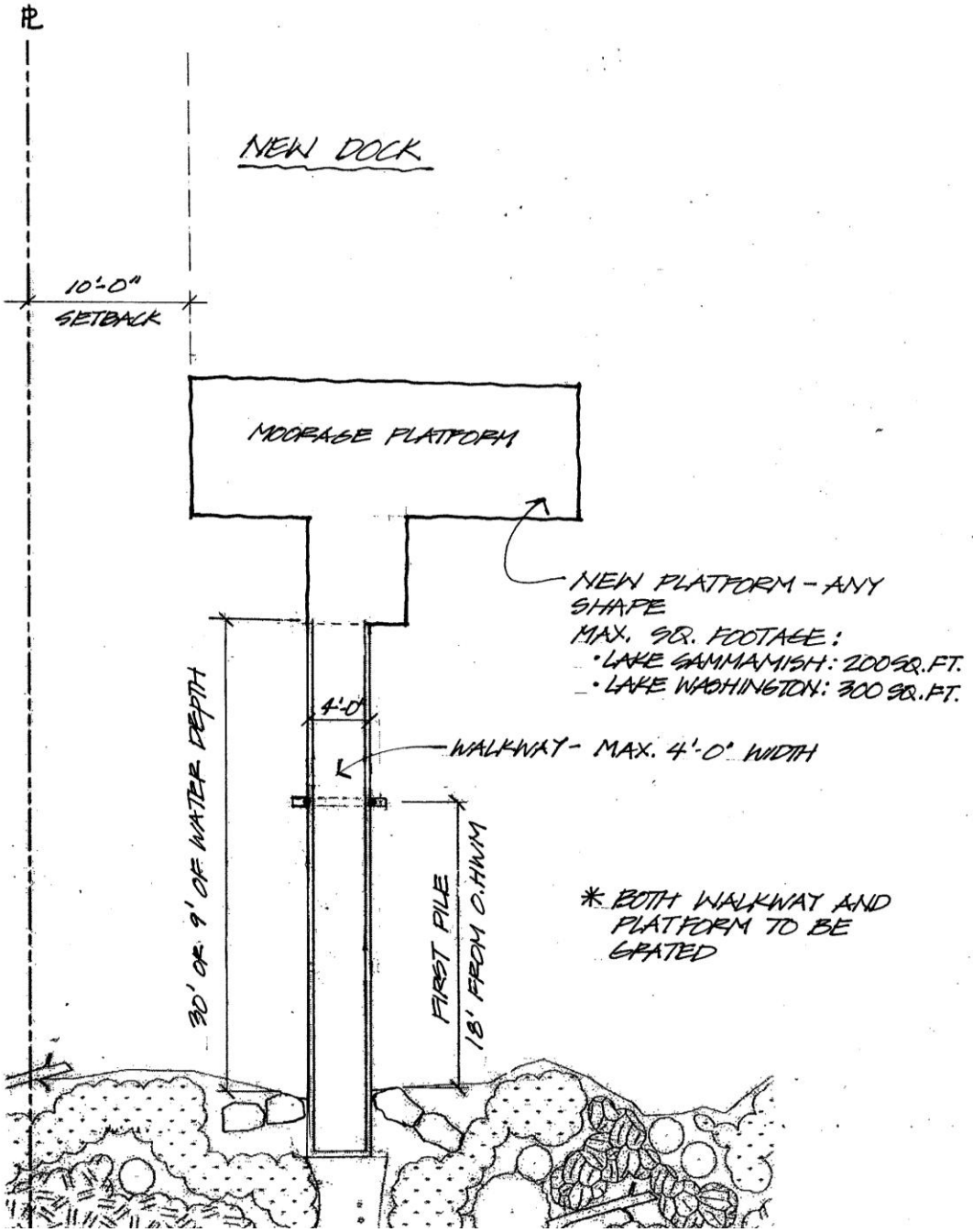
triangle. Staff are proposing to eliminate the moorage triangle and allow for placement anywhere on the moorage platform or for existing facilities require placement outside of the nearshore area or beyond 30 feet measured from the OHWM.

16) **Landscape Standard** – New dock construction requires the improvement of landward edge of shoreline with shoreline plantings. Shoreline plantings may be located in a manner that retains functional access to the shoreline and may be consolidated on property periphery. The requirement of shoreline plantings for new docks or piers is intended to help mitigate the impacts related to new facilities and facilitate the re-establishment of native vegetation along the shoreline. Current regulations require shoreline plantings 10 feet in width for the entire shoreline frontage. This proposal will change this requirement to allow for additional flexibility in the location of shoreline plantings that is consistent with the previously presented vegetation conservation/landscape requirements.

17) **Invasive Weeds** – Invasive weeds shall be removed with new dock construction or dock replacement. Removal of invasive weeds helps restrict the spread and establishment of these weeds and improves overall shoreline condition. Removal of invasive weeds is required under RCW 17.10. Current regulations allow for the removal of invasive weeds but do not require it. This proposed rule would require the removal of invasive weeds for new dock construction or dock replacement.

New Docks - Phantom Lake and Newport Shores (Canals) In addition to the standards identified above, separate dock standards for Phantom Lake and the Newport Shores Residential Canal environment are presented. Due to the lack of motorized watercraft, a new dock standards for Phantom Lake allows a dock of up to 4 feet in width and an overall size of 200 square feet. The dock surface must be grated. For the Newport Shores Shoreline Residential Canal environment, a standard prohibits walkways and allows grated moorage platforms up to 100 square feet in size connected to the bulkhead walls supported by up to 8 inch piling. Proposed dock facility standards for both Phantom Lake and Newport Shores would allow for floating docks as long as grating is provided.

New Docks – Lake Washington and Lake Sammamish This applies to the construction of a new dock where there was no previous dock, or where the previous dock was allowed to deteriorate to a state of disrepair. New docks must meet prescriptive standards including facility dimensions, materials requirements, and shoreline landscape improvements. The following diagram generally depicts the standards described below:


℄
NEW DOCK
10'-0"
SETBACK
MOORAGE PLATFORM
NEW PLATFORM - ANY SHAPE
MAX. SQ. FOOTAGE:
• LAKE SAMMAMISH: 200 SQ. FT.
• LAKE WASHINGTON: 300 SQ. FT.
4'-0"
WALKWAY - MAX. 4'-0" WIDTH
30' OR 9' OF WATER DEPTH
FIRST PILE
18' FROM O.HWM
* BOTH WALKWAY AND PLATFORM TO BE GRATED

Walkway Standards: The walkway is that portion of the facility that provides access to the moorage platform and extends to at least a depth of nine feet and at least 30 feet perpendicular from the OHWM. Proposed dock standards focus on the first 30 feet and attempt to limit or influence the size and condition of a dock or pier in this area. Although limited to 4 feet in width, new dock standards allow for unlimited coverage (square footage) on the walkway to obtain access to deeper water (greater of nine feet in depth or 30 feet in length measured from the OHWM).

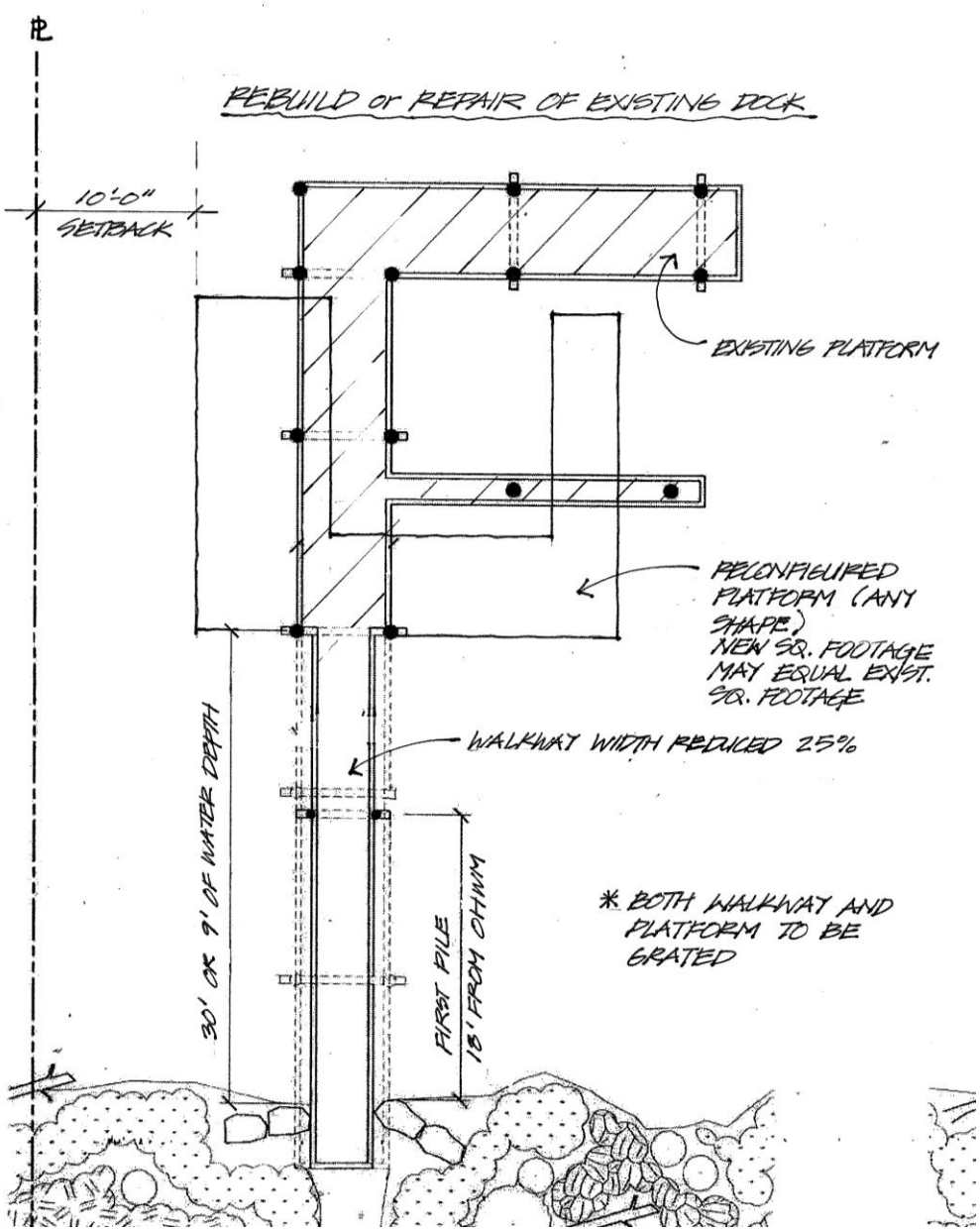
1) **Walkway orientation** – Should be perpendicular to the shoreline to limit overwater coverage in the nearshore area and access deeper water in an efficient design. This proposed rule is intended to orient dock construction in the most efficient crossing of the nearshore to deeper water. Current regulations do not restrict walkway orientation.
2) **Walkway width** – New walkways accessing docks and piers shall be no more than 4 feet in width and shall extend to the greater of nine feet in depth or 30 feet in distance as measured from the OHWM. This limits overwater coverage in the nearshore area reducing impact from shading. Current regulations limit walkway width to 4 feet for the first 30 feet. This proposed rule would change the length of the walkway from 30 feet to the greater of 30 feet in distance or nine feet in depth.
3) **Surface materials** - Grating shall cover the entire surface area (100%) of the dock or pier walkway. This allows for an increase in light penetration and limits impact from shading. The current code requires grating. There is no change proposed.
4) **Depth** - To prevent damage to shallow water habitat walkways accessing docks and piers shall extend to at least nine feet of depth and at least 30 feet perpendicular to the ordinary high water mark (OHWM). The current rules require walkways be 30 feet in length. This proposed rule would require the walkway extend to at least 9 feet of depth in addition to the minimum 30 feet of length and would not restrict overwater coverage for the walkway.
5) **Construction materials** - Piling that support the walkway shall not exceed 8 inches in diameter and shall be more than 18 feet from the OHWM. This limits impacts to shoreline currents and sediment transport, and reduces the amount of habitat favorable to predatory fish populations. Other limitations on dock construction materials limit the use of preservatives and the method of construction to reduce the potential for environmental degradation due to use of inappropriate materials. Restrictions on piling size and use of preservatives are in the current regulations. Where not otherwise prohibited, the proposed rule would increase the size of piling allowed from 4 inches to 8 inches but would be limited to the minimum necessary. Restrictions on use of preservatives would remain.
6) **Moorage boatlifts, and watercraft lifts** – Should be located on the moorage platform not the dock walkway. This reduces the level of impact from vessel shading and reduces impacts from activities associated with boat use and maintenance.
7) **Dock and pier walkways on Phantom Lake**- Shall be limited to 4 feet in width with maximum overwater coverage of 200 square feet. Due to lack of motorized watercraft on Phantom Lake, facilities shall be limited to a total of 200 square feet for the purpose of accessing human powered watercraft, swimming, and fishing.
8) **Dock Walkways in the Shoreline Residential Canal (SRC) environment-** Are prohibited. Maintained navigable depths are available adjacent to the canal structural bulkheads and no walkway is needed.

9) **Ramps and bridges-** Walkways may be constructed in the form of ramps or bridges provided the railing height does not exceed the minimum requirements of the building code. This is intended to provide flexibility in design of dock walkways.

Moorage Platform Standards: The standards presented allow a high level of flexibility for the moorage platform, or that section of the facility located beyond a depth of greater than nine feet and at least 30 feet perpendicular from the OHWM. General coverage limitations for the moorage platform are: 200 feet for Lake Sammamish; and 300 feet for Lake Washington. The distinction is made due to the size and type of watercraft found in each lake. Outside of overall size and the observance of structure setbacks, staff do not anticipate restricting the configuration of this (moorage platform) component of the facility. Property owners and designers may work to design the optimal moorage platform facility using the available square footage.

1) **Moorage platform dimension** – Moorage platforms for new or replacement docks and piers shall be located beyond the greater of at least nine (9) feet of depth or 30 feet from OHWM. This locates impacts from shading related to boat storage, boat maintenance activities, and and activity related to boat use outside of the nearshore and into deeper water. This rule exists in the current code, although it has been amended to include a minimum depth of 9 feet in addition to the minimum distance of 30 feet. Moorage platforms shall be the minimum size necessary to facilitate the functional moorage of boats and watercraft. This is required by the WAC guidelines and is intended to limit the construction of docks to a size appropriate to the intended facility function. Moorage platforms shall be limited to no more than 200 sf of overwater coverage on Lake Sammamish, 300 feet of overwater coverage on Lake Washington, and 100 feet within the Shoreline Residential Canal (SRC) shoreline environment. This responds the different size vessel on each of the lakes and the unique conditions of the Newport Shores canal areas. Moorage platforms are prohibited on Phantom Lake. There are no motorized watercraft on Phantom Lake and therefore no need for a moorage platform. Personal human powered watercraft may be launched and tied to a smaller facility.
2) **Piling**- Dock and pier structural piling supporting dock moorage platforms shall be no larger than 12 inches in size. A larger size is allowed for the moorage platform (as compared to the 8 inch size restriction for the walkway) to provide additional structural support in the mooring of boats.
3) **Surface materials-**The surface of moorage platforms shall be 100% grated. This facilitates the transmission of light and reduces change in natural level of daytime lighting.

Dock Reconfiguration and Replacement Standards:
These standards apply to a voluntary action on the part of the property owner to reconfigure, add amenities (boatlifts), or substantially repair an existing dock. Substantial repair refers to replacement of more than 50% of the dock piling. Dock reconfigurations and substantial repairs must comply with prescriptive standards that include facility dimension restrictions and materials requirements. Under this scenario, voluntary dock reconfiguration or repairs where more than 50% of the piling are replaced requires narrowing of the walkway, grating of the dock surface, and use of new materials, although overall square footage of the moorage platform (that portion of the facility that is more than 30 feet landward of the OHWM and in water with greater than 9 feet of depth) may be retained. See the following diagram for depiction of standards.



1) Required when more than 50% of the structural piling are replaced or the facility is voluntarily reconfigured. Reconfiguration or substantial replacement of piling are good opportunities to modify structure design to reduce overwater structure coverage in the nearshore.
2) Must meet the minimum 10 foot property line setback. This is a standard requirement.
3) May not exceed 150 feet in overall facility length. This is a standard requirement.
4) That portion of the existing dock that is closer than 30 feet to the OHWM and within less than 9 feet of water (the "Walkway") shall be narrowed by 25%. If the existing walkway is 10 feet in width, it should be narrowed to no more than 7.5 feet, although a lessor number is acceptable down to a minimum requirement of 4 feet in width. If the existing dock walkway is narrower than 4 feet, it may be replaced at up to 4 feet in width. This

facilitates the transmission of light and reduces change in natural level of daytime lighting.

5) That portion of the facility that is further than 30 feet from the OHWM and in water deeper than 9 feet (the "Moorage Platform") may be reconfigured to retain the existing overwater coverage (square footage). If the moorage platform of the existing facility is less than that allowed for a new facility, the moorage platform may be built to the size allowed for a new facility. This is intended to provide flexibility through the retention of additional overwater coverage for that portion of an existing dock facility that is larger than that allowed for a new dock moorage platform. The intent is to restrict the width of the dock walkway in the nearshore, and provide flexibility in facility design and size in deeper water.
6) The entire facility surface (walkway and moorage platform) shall be grated. This facilitates the transmission of light and reduces change in natural level of daytime lighting. This is in the current code although is not always required.
7) Requires use of piling 8 inches in diameter or smaller for walkway, 12 inches or smaller for platform. This limits obstructions to longitudal processes and limits availability of predator habitat. This is increased from the current code from 4 inches to 8 inches. Structural piling for any portion of the facility should be the minimum necessary.
8) Requires the use of enhanced materials such as steel or untreated piling, non-zinc plated hardware, and appropriate preservatives. This reduces long term residual impacts to water and environmental quality. This is in the current code although zinc coated materials are not clearly identified.

Dock Repair –repair or maintenance action to an existing dock. Repair constitutes any work to the dock decking or structure that does not include the replacement of more than 50% of the dock piling. Dock repairs or maintenance actions must comply with prescriptive standards such as surface requirements and materials specifications. It is important to note that repair and maintenance does not require facility removal or significant facility modification. Typically, a dock may be replaced under the definition of repair if less than 50% of the piling are replaced. In all cases of repair the only requirements are surface grating and improved materials requirements – configuration may be retained.

1) Required for any repair that does not involve reconfiguration or the replacement of more than 50% of the structural piling or where the scope of the repair includes elements targeted for improvement. The intent of this regulation is incremental improvement.
2) Elements targeted for improvement as part of dock repair include:
    a. Piling size and material.
    b. Dock surface.
    c. Enhanced materials.
3) Repair of dock surface requires the use of grating when area of surface replacement includes area equivalent to one panel of standard residential dock surface grating. If entire dock surface is being replaced, the entire dock surface must be replaced with grating. This is in the current code as a requirement of partial compliance. Under this proposed change, the use of grating would only be required when it can be incorporated into the dock surface. As stated above, grating facilitates the transmission of light and reduces change in natural level of daytime lighting.

4) When dock structural piling are being replaced (less than 50% total replacement), use of piling 8 inches or smaller for the walkway and 12 inches or smaller for the moorage platform shall be used. This is in the current code although the piling size restriction has been raised from 4 inches to 8 inches for walkways. This limits obstructions to longitudal processes and limits availability of predator habitat.
5) Requires the use of enhanced materials such as steel or untreated piling, non-zinc plated hardware, and appropriate preservatives.

Significant Improvement of an existing dock/pier– This option applies to a voluntary repair or replacement taken by a property owner with an existing dock where the proposal does not conform to the prescriptive standard but a net improvement is being made. This option roughly follows the critical areas report process found in the LUC 20.25H.230 and is allowed only when a net improvement is being made over the existing condition. This option is not available for new docks and may be used with existing functional docks only. Although this option provides flexibility, it is more intensive in supporting documentation, permitting time, and cost. The intent of this option is enhanced flexibility for unanticipated situations or specific property owner objectives.

Shoreline Variance –A variance is required for projects where there are unavoidable physical constraints, when facility design does not meet the prescriptive standards, and where the significant improvement option requirements outlined above are not being met. Shoreline Variances are subject to compliance with specific criteria and State Department of Ecology approval and follow the process guidelines established in the WAC.

SHORELINE STABILIZATION

Current Code- New stabilization

The City's current regulations for shoreline stabilization and bulkheads were updated in 2006 as part of changes to the City's critical areas regulations (See Attachment 8 for current code provisions). During that update, staff referenced the State Guidelines in presenting the changes to the Commission. The provisions applicable to new stabilizations, including bulkheads, allows new or enlarged shoreline stabilization measures only to protect existing primary structures, public facilities or public use structures and allowed land area. Stabilization measures are allowed only where avoidance measures are not technically feasible. The determination of technically feasible is based on site conditions, location of existing infrastructure, risk to primary structures, public facility or public use structures and allowed land area and ability to mitigate the risk, cost of avoiding disturbance compared to environmental impact, and ability to mitigate disturbance. When a stabilization measure is allowed, soft techniques (those that use natural materials to provide stabilization while mimicking or preserving functions and values) are preferred over hardened techniques (measures which present a vertical or nearly vertical interface with the water).

Included in these provisions is a distinction between minor and major repair. Minor repair refers to modifications and improvements to an existing stabilization measure designed to ensure continued function of the stabilization by preventing failure of any part of the stabilization. A repair that is proposed after a significant portion of the stabilization measure has collapsed,

eroded away or otherwise demonstrated a loss of structural integrity is not minor repair. The concept is that if a structure is maintained routinely over time, this should be allowed. However, the point where maintenance is neglected to the point where the functional integrity of the structure is compromised this rebuilding would be considered and assessed as needing to meet new stabilization measure standards.

Regulatory approach for new stabilization

No changes to the standards are recommended to meet the Guidelines because of the prescriptive nature of the WAC Guidelines and the recent update to the City code. However, with an interest in providing predictable support to homeowners who have a concern related to shoreline erosion and the protection of their residences, staff suggests developing guidance in determining when hardened stabilization measures are acceptable, when softened stabilization measures are acceptable, and when stabilization is discouraged or prohibited. Current rules require a property owner to demonstrate through the hiring of an independent expert, the need for a stabilization measures. Rather than requiring a separate report, standards will be developed after principles found in the Green Shorelines Guidebook developed by the City of Seattle (See excerpt in Attachment 9).

Repair thresholds will be a topic of further conversation. A full discussion of the repair thresholds will be provided at the next Commission study session in September after additional outreach with citizens and interested parties is conducted.

NEXT STEPS

Staff seeks Commission direction on proceeding with dock/pier and boatlift standards introduced in this memorandum. Staff will return at a later date with detailed policy and code language for Commission review. With the Commission's recess in August, staff will continue to work on regulatory details as directed by the Commission and will work with citizen groups on review of other regulatory concepts.

September/October	Continued shoreline stabilization discussion, nonconformities and other issues Introduce revised draft Continue review of revised draft
October/November	Open house Public Hearing on revised draft
November	Make recommendation to City Council

ATTACHMENTS

1. Excerpt from WAC Guidelines
2. Excerpts from working draft
3. Comments from Department of Ecology staff
4. Other jurisdiction code excerpts
5. Regional General Permits 1 and 3 and WDFW- WAC authority
6. Army Corps of Engineers Document *Minimizing Effects of Over-Water Docks on Federally Listed Fish Stocks in McNary Reservoir; A Literature Review for Criteria*
7. Current code excerpt- moorage
8. Current code excerpt- stabilization
9. Green Shorelines excerpt

inconsistent with planning provisions for restoration of shoreline ecological functions.

(iii) Designation Criteria

Assign a "rural conservancy" environment designation to shoreline areas outside incorporated municipalities and outside urban growth areas, as defined by RCW 36.70A.110, if any of the following characteristics apply:

(A) The shoreline is currently supporting lesser-intensity resource-based uses, such as agriculture, forestry, or recreational uses, or is designated agricultural or forest lands pursuant to RCW 36.70A.170;

(B) The shoreline is currently accommodating residential uses outside urban growth areas and incorporated cities or towns;

(C) The shoreline is supporting human uses but subject to environmental limitations, such as properties that include or are adjacent to steep banks, feeder bluffs, or flood plains or other flood-prone areas;

(D) The shoreline is of high recreational value or with unique historic or cultural resources; or

(E) The shoreline has low-intensity water-dependent uses.

Areas designated in a local comprehensive plan as "rural areas of more intense development," as provided for in chapter 36.70A RCW, may be designated an alternate shoreline environment, provided it is consistent with the objectives of the Growth Management Act and this chapter. "Master planned resorts" as described in RCW 36.70A.360 may be designated an alternate shoreline environment, provided the applicable master program provisions do not allow significant ecological impacts.

Lands that may otherwise qualify for designation as rural conservancy and which are designated as "mineral resource lands" pursuant to RCW 36.70A.170 and WAC 365-190-070 may be assigned a designation within the "rural conservancy" environment that allows mining and associated uses in addition to other uses consistent with the rural conservancy environment.

(c) "Aquatic" environment.

(i) Purpose.

The purpose of the "aquatic" environment is to protect, restore, and manage the unique characteristics and resources of the areas waterward of the ordinary high-water mark.

(ii) Management policies.

(A) Allow new over-water structures only for water-dependent uses, public

access, or ecological restoration.

(B) The size of new over-water structures should be limited to the minimum necessary to support the structure's intended use.

(C) In order to reduce the impacts of shoreline development and increase effective use of water resources, multiple use of over-water facilities should be encouraged.

(D) All developments and uses on navigable waters or their beds should be located and designed to minimize interference with surface navigation, to consider impacts to public views, and to allow for the safe, unobstructed passage of fish and wildlife, particularly those species dependent on migration.

(E) Uses that adversely impact the ecological functions of critical saltwater and freshwater habitats should not be allowed except where necessary to achieve the objectives of RCW 90.58.020, and then only when their impacts are mitigated according to the sequence described in WAC 173-26-201(2)(e) as necessary to assure no net loss of ecological functions.

(F) Shoreline uses and modifications should be designed and managed to prevent degradation of water quality and alteration of natural hydrographic conditions.

(iii) Designation Criteria

Assign an "aquatic" environment designation to lands waterward of the ordinary high-water mark.

Local governments may designate submerged and intertidal lands with shoreland designations (e.g., "high-intensity" or "rural conservancy") if the management policies and objectives for aquatic areas are met. In this case, the designation system used must provide regulations for managing submerged and intertidal lands that are clear and consistent with the "aquatic" environment management policies in this chapter. Additionally, local governments may assign an "aquatic" environment designation to wetlands.

(d) "High-intensity" environment.

(i) Purpose.

The purpose of the "high-intensity" environment is to provide for high-intensity water-oriented commercial, transportation, and industrial uses while protecting existing ecological functions and restoring ecological functions in areas that have been previously degraded.

(ii) Management policies.

(A) In regulating uses in the "high-intensity" environment, first priority should be given to water-dependent uses. Second priority should be given to water-related and water-enjoyment uses. Non-water oriented

this section.

WAC 173-26-231 Shoreline modifications.

(1) Applicability.

Local governments are encouraged to prepare master program provisions that distinguish between shoreline modifications and shoreline uses. Shoreline modifications are generally related to construction of a physical element such as a dike, breakwater, dredged basin, or fill, but they can include other actions such as clearing, grading, application of chemicals, or significant vegetation removal. Shoreline modifications usually are undertaken in support of or in preparation for a shoreline use; for example, fill (shoreline modification) required for a cargo terminal (industrial use) or dredging (shoreline modification) to allow for a marina (boating facility use).

The provisions in this section apply to all shoreline modifications within shoreline jurisdiction.

(2) General principles applicable to all shoreline modifications.

Master programs shall implement the following principles:

(a) Allow structural shoreline modifications only where they are demonstrated to be necessary to support or protect an allowed primary structure or a legally existing shoreline use that is in danger of loss or substantial damage or are necessary for reconfiguration of the shoreline for mitigation or enhancement purposes.

(b) Reduce the adverse effects of shoreline modifications and, as much as possible, limit shoreline modifications in number and extent.

(c) Allow only shoreline modifications that are appropriate to the specific type of shoreline and environmental conditions for which they are proposed.

(d) Assure that shoreline modifications individually and cumulatively do not result in a net loss of ecological functions. This is to be achieved by giving preference to those types of shoreline modifications that have a lesser impact on ecological functions and requiring mitigation of identified impacts resulting from shoreline modifications.

(e) Where applicable, base provisions on scientific and technical information and a comprehensive analysis of drift cells for marine waters or reach conditions for river and stream systems. Contact the department for available drift cell characterizations.

(f) Plan for the enhancement of impaired ecological functions where feasible and appropriate while accommodating permitted uses. As shoreline modifications occur, incorporate all feasible measures to protect ecological shoreline functions and ecosystem-wide processes.

(g) Avoid and reduce significant ecological impacts according to the mitigation sequence in WAC 173-26- 201(2)(e).

(3) Provisions for specific shoreline modifications.

(a) Shoreline stabilization.

(i) Applicability.

Shoreline stabilization includes actions taken to address erosion impacts to property and dwellings, businesses, or structures caused by natural processes, such as current, flood, tides, wind, or wave action. These actions include structural and nonstructural methods.

Nonstructural methods include building setbacks, relocation of the structure to be protected, ground water management, planning and regulatory measures to avoid the need for structural stabilization.

(ii) Principles.

Shoreline are by nature unstable, although in varying degrees. Erosion and accretion are natural processes that provide ecological functions and thereby contribute to sustaining the natural resource and ecology of the shoreline. Human use of the shoreline has typically led to hardening of the shoreline for various reasons including reduction of erosion or providing useful space at the shore or providing access to docks and piers. The impacts of hardening any one property may be minimal but cumulatively the impact of this shoreline modification is significant.

Shoreline hardening typically results in adverse impacts to shoreline ecological functions such as:

- Beach starvation. Sediment supply to nearby beaches is cut off, leading to "starvation" of the beaches for the gravel, sand, and other fine-grained materials that typically constitute a beach.
- Habitat degradation. Vegetation that shades the upper beach or bank is eliminated, thus degrading the value of the shoreline for many ecological functions, including spawning habitat for salmonids and forage fish.
- Sediment impoundment. As a result of shoreline hardening, the sources of sediment on beaches (eroding "feeder" bluffs) are progressively lost and longshore transport is diminished. This leads to lowering of down-drift beaches, the narrowing of the high tide beach, and the coarsening of beach sediment. As beaches become more coarse, less prey for juvenile fish is produced. Sediment starvation may lead to accelerated erosion in down-drift areas.
- Exacerbation of erosion. The hard face of shoreline armoring, particularly concrete bulkheads, reflects wave energy back onto the beach, exacerbating erosion.
- Ground water impacts. Erosion control structures often raise the water table on the landward side, which leads to higher pore pressures in the

beach itself. In some cases, this may lead to accelerated erosion of sand-sized material from the beach.

- Hydraulic impacts. Shoreline armoring generally increases the reflectivity of the shoreline and redirects wave energy back onto the beach. This leads to scouring and lowering of the beach, to coarsening of the beach, and to ultimate failure of the structure.
- Loss of shoreline vegetation. Vegetation provides important "softer" erosion control functions. Vegetation is also critical in maintaining ecological functions.
- Loss of large woody debris. Changed hydraulic regimes and the loss of the high tide beach, along with the prevention of natural erosion of vegetated shorelines, lead to the loss of beached organic material. This material can increase biological diversity, can serve as a stabilizing influence on natural shorelines, and is habitat for many aquatic-based organisms, which are, in turn, important prey for larger organisms.
- Restriction of channel movement and creation of side channels. Hardened shorelines along rivers slow the movement of channels, which, in turn, prevents the input of larger woody debris, gravels for spawning, and the creation of side channels important for juvenile salmon rearing, and can result in increased floods and scour.

Additionally, hard structures, especially vertical walls often create conditions that lead to failure of the structure. In time, the substrate of the beach coarsens and scours down to bedrock or a hard clay. The footings of bulkheads are exposed, leading to undermining and failure. This process is exacerbated when the original cause of the erosion and "need" for the bulkhead was from upland water drainage problems. Failed bulkheads and walls adversely impact beach aesthetics, may be a safety or navigational hazard, and may adversely impact shoreline ecological functions.

"Hard" structural stabilization measures refer to those with solid, hard surfaces, such as concrete bulkheads, while "soft" structural measures rely on less rigid materials, such as biotechnical vegetation measures or beach enhancement. There is a range of measures varying from soft to hard that include:

- Vegetation enhancement;
- Upland drainage control;
- Biotechnical measures;
- Beach enhancement;
- Anchor trees;
- Gravel placement;
- Rock revetments;
- Gabions;
- Concrete groins;
- Retaining walls and bluff walls;
- Bulkheads; and

- Seawalls.

Generally, the harder the construction measure, the greater the impact on shoreline processes, including sediment transport, geomorphology, and biological functions.

Structural shoreline stabilization often results in vegetation removal and damage to near-shore habitat and shoreline corridors. Therefore, master program shoreline stabilization provisions shall also be consistent with WAC 173-26-221(5), vegetation conservation, and where applicable, WAC 173-26-221(2), critical areas.

In order to implement RCW 90.58.100(6) and avoid or mitigate adverse impacts to shoreline ecological functions where shoreline alterations are necessary to protect single-family residences and ~~principal~~ primary appurtenant structures in danger from active shoreline erosion, 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.

(iii) Standards.

In order to avoid the individual and cumulative net loss of ecological functions attributable to shoreline stabilization, master programs shall implement the above principles and apply the following standards:

(A) New development should be located and designed to avoid the need for future shoreline stabilization to the extent feasible. Subdivision of land must be regulated to assure that the lots created will not require shoreline stabilization in order for reasonable development to occur using geotechnical analysis of the site and shoreline characteristics. New development on steep slopes or bluffs shall be set back sufficiently to ensure that shoreline stabilization is unlikely to be necessary during the life of the structure, as demonstrated by a geotechnical analysis. New development that would require shoreline stabilization which causes significant impacts to adjacent or down-current properties and shoreline areas should not be allowed.

(B) New structural stabilization measures shall not be allowed except when necessity is demonstrated in the following manner:

(I) To protect existing primary structures:

- New or enlarged structural shoreline stabilization measures for an existing primary structure, including residences, should not be allowed unless there is conclusive evidence, documented by a geotechnical analysis, that the structure is in danger from shoreline erosion caused by tidal action, currents, or waves. Normal sloughing, erosion of steep bluffs, or shoreline erosion itself, without a scientific or geotechnical analysis, is not demonstration of need. The geotechnical analysis should evaluate on-site

drainage issues and address drainage problems away from the shoreline edge before considering structural shoreline stabilization.

- The erosion control structure will not result in a net loss of shoreline ecological functions.

(II) In support of new non-water-dependent development, including single-family residences, when all of the conditions below apply:

- The erosion is not being caused by upland conditions, such as the loss of vegetation and drainage.
- Nonstructural measures, such as placing the development further from the shoreline, planting vegetation, or installing on-site drainage improvements, are not feasible or not sufficient.
- The need to protect primary structures from damage due to erosion is demonstrated through a geotechnical report. The damage must be caused by natural processes, such as tidal action, currents, and waves.
- The erosion control structure will not result in a net loss of shoreline ecological functions.

(III) In support of water-dependent development when all of the conditions below apply:

- The erosion is not being caused by upland conditions, such as the loss of vegetation and drainage.
- Nonstructural measures, planting vegetation, or installing on-site drainage improvements, are not feasible or not sufficient.
- The need to protect primary structures from damage due to erosion is demonstrated through a geotechnical report.
- The erosion control structure will not result in a net loss of shoreline ecological functions.

(IV) To protect projects for the restoration of ecological functions or hazardous substance remediation projects pursuant to chapter 70.105D RCW when all of the conditions below apply:

- Nonstructural measures, planting vegetation, or installing on-site drainage improvements, are not feasible or not sufficient.
- The erosion control structure will not result in a net loss of shoreline ecological functions.

(C) An existing shoreline stabilization structure may be replaced with a similar structure if there is a demonstrated need to protect principal uses or structures from erosion caused by currents, tidal action, or waves.

- The replacement structure should be designed, located, sized, and constructed to assure no net loss of ecological functions.

- Replacement walls or bulkheads shall not encroach waterward of the ordinary high-water mark or existing structure unless the residence was occupied prior to January 1, 1992, and there are overriding safety or environmental concerns. In such cases, the replacement structure shall abut the existing shoreline stabilization structure.
- Where a net loss of ecological functions associated with critical saltwater habitats would occur by leaving the existing structure, remove it as part of the replacement measure.
- Soft shoreline stabilization measures that provide restoration of shoreline ecological functions may be permitted waterward of the ordinary high-water mark.
- For purposes of this section standards on shoreline stabilization measures, "replacement" means the construction of a new structure to perform a shoreline stabilization function of an existing structure which can no longer adequately serve its purpose. Additions to or increases in size of existing shoreline stabilization measures shall be considered new structures.

(D) Geotechnical reports pursuant to this section that address the need to prevent potential damage to a primary structure shall address the necessity for shoreline stabilization by estimating time frames and rates of erosion and report on the urgency associated with the specific situation. As a general matter, hard armoring solutions should not be authorized except when a report confirms that that there is a significant possibility that such a structure will be damaged within three years as a result of shoreline erosion in the absence of such hard armoring measures, or where waiting until the need is that immediate, would foreclose the opportunity to use measures that avoid impacts on ecological functions. Thus, where the geotechnical report confirms a need to prevent potential damage to a primary structure, but the need is not as immediate as the three years, that report may still be used to justify more immediate authorization to protect against erosion using soft measures.

(E) When any structural shoreline stabilization measures are demonstrated to be necessary, pursuant to above provisions,

- limit the size of stabilization measures to the minimum necessary. Use measures designed to assure no net loss of shoreline ecological functions Soft approaches shall be used unless demonstrated not to be sufficient to protect primary structures, dwellings, and businesses.
- Ensure that publicly financed or subsidized shoreline erosion control measures do not restrict appropriate public access to the shoreline except where such access is determined to be infeasible because of incompatible uses, safety, security, or harm to ecological functions. See public access provisions; WAC 173-26-221(4). Where feasible,

incorporate ecological restoration and public access improvements into the project.

- Mitigate new erosion control measures, including replacement structures, on feeder bluffs or other actions that affect beach sediment-producing areas to avoid and, if that is not possible, to minimize adverse impacts to sediment conveyance systems. Where sediment conveyance systems cross jurisdictional boundaries, local governments should coordinate shoreline management efforts. If beach erosion is threatening existing development, local governments should adopt master program provisions for a beach management district or other institutional mechanism to provide comprehensive mitigation for the adverse impacts of erosion control measures.

(F) For erosion or mass wasting due to upland conditions, see WAC 173-26-221(2)(c)(ii).

(b) Piers and docks.

New piers and docks shall be allowed only for water-dependent uses or public access. As used here, a dock associated with a single family residence is a water dependent use provided that it is designed and intended as a facility for access to watercraft and otherwise complies with the provisions of this section. Pier and dock construction shall be restricted to the minimum size necessary to meet the needs of the proposed water-dependent use. Water-related and water-enjoyment uses may be allowed as part of mixed-use development on over-water structures where they are clearly auxiliary to and in support of water-dependent uses, provided the minimum size requirement needed to meet the water-dependent use is not violated.

New pier or dock construction, excluding docks accessory to single-family residences, should be permitted only when the applicant has demonstrated that a specific need exists to support the intended water-dependent uses. If a port district or other public or commercial entity involving water-dependent uses has performed a needs analysis or comprehensive master plan projecting the future needs for pier or dock space, and if the plan or analysis is approved by the local government and consistent with these guidelines, it may serve as the necessary justification for pier design, size, and construction. The intent of this provision is to allow ports and other entities the flexibility necessary to provide for existing and future water-dependent uses.

Where new piers or docks are allowed, master programs should contain provisions to require new residential development of two or more dwellings to provide joint use or community dock facilities, when feasible, rather than allow individual docks for each residence.

Piers and docks, including those accessory to single-family residences, 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. See WAC 173-26-221 (2)(c)(iii) and (iv). Master programs should require that structures be made of

materials that have been approved by applicable state agencies.

(c) Fill.

Fills shall be located, designed, and constructed to protect shoreline ecological functions and ecosystem-wide processes, including channel migration.

Fills waterward of the ordinary high-water mark shall be allowed only when necessary to support: water-dependent use, public access, cleanup and disposal of contaminated sediments as part of an interagency environmental clean-up plan, disposal of dredged material considered suitable under, and conducted in accordance with the Dredged Material Management Program of the Department of Natural Resources, expansion or alteration of transportation facilities of statewide significance currently located on the shoreline and then only upon a demonstration that alternatives to fill are not feasible, mitigation action, environmental restoration, beach nourishment or enhancement project . Fills waterward of the ordinary high-water mark for any use except ecological restoration should require a conditional use permit.

(d) Breakwaters, jetties, groins, and weirs.

Breakwaters, jetties, groins, and weirs located waterward of the ordinary high-water mark shall be allowed only where necessary to support water-dependent uses, public access, shoreline stabilization, or other specific public purpose. Breakwaters, jetties, groins, weirs, and similar structures should require a conditional use permit, except for those structures installed to protect or restore ecological functions, such as woody debris installed in streams. 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).

(e) Beach and dunes management.

Washington's beaches and their associated dunes lie along the Pacific Ocean coast between Point Grenville and Cape Disappointment, and as shorelines of statewide significance are mandated to be managed from a statewide perspective by the Act. Beaches and dunes within shoreline jurisdiction shall be managed to conserve, protect, where appropriate develop, and where appropriate restore the resources and benefits of coastal beaches. Beaches and dunes should also be managed to reduce the hazard to human life and property from natural or human-induced actions associated with these areas.

Shoreline master programs in coastal marine areas shall provide for diverse and appropriate use of beach and dune areas consistent with their ecological, recreational, aesthetic, and economic values, and consistent with the natural limitations of beaches, dunes, and dune vegetation for development. Coastal master programs shall institute development setbacks from the shoreline to prevent impacts to the natural, functional, ecological, and aesthetic qualities of the dune.

"Dune modification" is the removal or addition of material to a dune, the reforming or reconfiguration of a dune, or the removal or addition of vegetation that will alter the

2.B.1. Aquatic (A) Environment

2.B.1.a. Purpose of the A Environment

The purpose of the Aquatic environment is to protect, manage, and restore the unique characteristics and resources of the areas waterward of the ordinary high water mark (OHWM).

2.B.1.b. A Designation Criteria

An Aquatic environment designation will be assigned to City of Bellevue shoreline areas waterward of the ordinary high-water mark.

2.B.1.c. A Management Policies

Policy SH-1. New over-water structures should be prohibited except for water-dependent uses, piers and docks accessory to single-family residences, public access, or ecological restoration.

Policy SH-2. The size of new over-water structures should be limited to the minimum necessary to support the structure's intended use and to assure no net loss of ecological functions.

Policy SH-3. Shared use of over-water structures should be encouraged.

Policy SH-4. Uses and structures determined to adversely impact the ecological function of shoreline areas should not be allowed except where necessary to achieve the objective of RCW 90.58.020 - Shoreline Management Act of 1971 (SMA) . The primary goals of the SMA are to encourage water-dependent uses, protect shoreline natural resources, and promote public access. If allowed, the impacts related to these uses and structures must be mitigated according to the sequence described in WAC 173-26-201(2)(e) (Comprehensive process to prepare or amend shoreline master programs), as necessary to assure no net loss of ecological functions.

Policy SH-5. Design and manage shoreline uses and modifications to prevent degradation of water quality.

Policy SH-6. Developments within the aquatic environment must be compatible with the abutting upland environment designation.

Policy SH-7. Encourage and support shoreline restoration in the Aquatic Environment and must improve ecological function.

Policy SH-8. New utility facilities (including underwater pipelines and cables) shall be prohibited; except, where there is no technically feasible alternative.

Policy SH-9. All developments and activities using navigable waters or their beds should be located and designed to minimize interference with surface navigation, to minimize adverse visual impacts, and to allow for safe and unobstructed passage of fish and wildlife, particularly those whose life cycle is dependent on migration.

2.B.4. Shoreline Residential (SR) Environment

2.B.4.a. Purpose of the SR Environment

The purpose of the Shoreline Residential environment is to accommodate single or multifamily residential development and associated accessory structures that are consistent with this shoreline master program.

2.B.4.b. SR Designation Criteria

A Shoreline Residential environment designation will be assigned to City of Bellevue's shorelands if they are predominantly residential development or are planned for residential development, and exhibit moderate to low levels of ecological functions because of historic shoreline modification.

2.B.4.c. SR Management Policies

Policy SH-21. Establish standards for density, minimum frontage width, setbacks, lot coverage limitations, shoreline stabilization, vegetation conservation, critical area protection, and water quality. Standards must be established to assure no net loss of shoreline ecological functions, taking into account the environmental limitations and sensitivity of the shoreline area, the level of infrastructure and services available, and other comprehensive planning considerations.

Policy SH-22. New multifamily and multi-lot residential and recreational developments should provide public access and joint use for community recreational facilities. This policy is not intended to apply to existing residential uses.

Policy SH-23. Water-oriented recreational uses should be allowed.

2.B.5. Shoreline Residential Canal (SRC) Environment

2.B.5.a. Purpose of the SRC Environment

The purpose of the Shoreline Residential Canal environment is to maintain single-family residential development adjacent to artificially-created canals in the Newport Shores Community. The SRC designation acknowledges the unique characteristics of that portion of the Newport Shores Community that is dependent on the artificial canals for access to waters of the state for the purpose of navigation. This environment also identifies specific physical and biological constraints related to the presence of engineered bulkheads to support the artificial canal system and the filled lands behind the bulkheads.

2.B.5.b. SRC Designation Criteria

A Shoreline Residential Canal environment designation is assigned to those properties within the Newport Shores community with frontage along an artificial canal system which is dependent upon engineered bulkheads for structural support. These areas are characterized by a relatively low-level ecological function. The SRC environment does

not include those Newport Shores properties that are located along sections of Lake Washington shoreline and not on canals.

2.B.5.c. SRC Management Policies

Policy SH-24. Allow for the maintenance, repair, and replacement of the canal structural bulkheads to retain the canals in their existing configuration as necessary to preserve the original design; provided the objective of no net loss of ecological function is satisfied.

Policy SH-25. Develop standards for density or minimum shoreline frontage width, setbacks, lot coverage limitations, buffers, shoreline stabilization, vegetation conservation, critical area protection, and water quality to assure no net loss of shoreline ecological functions, taking into account the environmental limitations and sensitivity of the shoreline area, the level of infrastructure and services available, and other comprehensive planning considerations.

Policy SH-26. Allow water-oriented recreational uses.

3.B.8. Residential Development

Residential development means one or more buildings, structures, lots, parcels or portions thereof which are designed for and used or intended to be used to provide a place of abode, including single-family residences, duplexes, other detached dwellings, floating homes, multi-family residences, mobile home parks, residential subdivisions, residential short subdivisions, and residential planned unit development, together with accessory uses and structures normally applicable to residential uses, including, but not limited to, garages, sheds, tennis courts, swimming pools, parking areas, fences, cabanas, saunas, and guest cottages. Residential development does not include hotels, motels, or any other type of overnight or transient housing or camping facilities.

Single family residences are a preferred use under the Shoreline Management Act when developed in a manner consistent with this Shoreline Master Program.

3.B.8.a. Applicability of Residential Development Policies and Regulations

These policies and regulations apply to residential uses and structures in the shoreline uses. For purposes of this section, accessory structures shall include garages, sheds, swimming pools, tennis courts, spas, greenhouses and similar facilities.

3.B.8.b. Residential Development Policies

POLICY SH-89. Single-family residential development is a preferred shoreline use, when developed in a manner consistent with control of pollution and prevention of damage to the natural environment.

POLICY SH-90. New primary residential structures should be prohibited in the setback from the shoreline; except where significant shoreline enhancement or restoration is proposed.

POLICY SH-91. Develop standards for both major and minor replacement, repair, and maintenance of existing structures and features.

POLICY SH-92. New or expanded residential development in the shoreline jurisdiction should be located and designed to minimize adverse effects on shoreline process and functions.

POLICY SH-93. Design of new residential development should protect, enhance, and restore shoreline ecological functions. Encourage use of low impact development stormwater management techniques, shoreline restoration, and other conservation measures.

POLICY SH-94. All residential development, including appurtenant structures and uses, should be sufficiently set back from steep slopes and shorelines vulnerable to erosion so that structural improvements or armoring are not required to protect such structures and uses.

POLICY SH-95. New residential development and expansions to existing residential structures shall be designed and located to eliminate the need for shoreline armoring and stabilization.

POLICY SH-96. Over-water residences, including floating homes, are not a preferred use and should be prohibited.

POLICY SH-97. New multiunit residential development, including the subdivision of land for more than four parcels, should provide community and/or public access.

POLICY SH-98. Allow maintenance of legally-established landscaping consistent with the Shoreline Master Program, and encourage conversion of landscaping to native vegetation.

POLICY SH-99. Acknowledge and address distinctive patterns of historic shoreline conditions and characteristics and respond to these conditions and characteristics by developing appropriate development standards.

POLICY SH-100. Allow existing, legally-established primary residential structures that encroach into the setback from the ordinary high water mark to be redeveloped within the existing footprint, provided, the redevelopment complies with the Shoreline Master Program.

POLICY SH-101. Create incentives and provide flexibility to encourage development and redevelopment to incorporate native vegetation, shoreline restoration, low impact development techniques, or softened shoreline stabilization, or other restoration measures determined by the Director.

POLICY SH-102. When subdividing waterfront property into 5 or more lots, require the reallocation of density away from sensitive shoreline resources to more appropriate upland locations.

ATTACHMENT 2

POLICY SH-103. Balance vegetation management, conservation, or restoration objectives, with residential shoreline uses, including recreation.

3.B.8.c. Residential Development Regulations (PROPOSED REGULATORY CONCEPTS)

- Develop standards for new single-family residential addressing siting, height, location, construction, repair, and maintenance (including legally-established landscaping).
- Develop standards that balance vegetation management, conservation, or restoration with the recreational use associated with residential shoreline.
- Develop standards to allow maintenance and repair of existing legally-established appurtenant structures.
- Develop standards prohibiting new appurtenant structures in the shoreline setback.
- Develop standards allowing limited intrusions into the setback, such as stairs, handrails, and trails providing access to the shoreline.
- Develop standards prohibiting the use of boats, houseboats, or watercraft as a permanent residence; except, for those proposed in the Marina Environment designation.
- Develop standards for new multifamily residential development addressing siting, height, location, construction, repair, maintenance, and public access (where applicable).
- Develop shoreline subdivision regulations that include requiring the clustering of density through subdivision of waterfront land into 5 or more lots. Provide incentives for property owners subdividing less than 5 lots with a flexible standard.
- Develop prescriptive criteria to allow modification of dimensional standards.

5.B.1.b. General Shoreline Modification Policies

POLICY SH –192. Assure that shoreline modifications, individually and cumulatively, do not result in a net loss of ecological functions.

POLICY SH –193. Shoreline modification actions should first avoid, and when avoidance is not technically feasible, minimize ecological impacts.

POLICY SH –194. Only allow shoreline modifications when in support of an allowed use or activity.

5.B.1.c. General Shoreline Modification Regulations (PROPOSED REGULATORY CONCEPTS)

- Develop standards which limit shoreline modification only when supporting an allowed use.
- New development or redevelopment shall be located and designed to avoid the need for new or future shoreline modification to the extent feasible. Provide flexibility in site design to eliminate or reduce the need for shoreline modification.
- Require project proponents to obtain and comply with all state and federally required permits and approvals.
- Require restoration of temporary disturbances associated with shoreline modification to pre-disturbance condition or better.
- Encourage the use of environmentally sustainable and non-toxic materials, and prohibit the use of specific treated wood products or invasive plants.

5.B.2. Shoreline Stabilization (including Bulkheads)

Shoreline stabilization includes measures taken to address erosion caused by shoreline processes and actions. These measures may be structural or nonstructural. Structural methods include “hard” and “soft” structural stabilization measures. Generally, the harder the construction measure, the greater the impact on shoreline processes, including sediment transport, geomorphology, and biological functions. Nonstructural methods include appropriate building setbacks, structure relocation to avoid the need for protection, managing erosion and ground water, and general measures that can be taken to avoid the need for structural stabilization.

Hard Structural Shoreline Stabilization means erosion control practices using hardened structures that armor and stabilize the shoreline from further erosion. Hard structural shoreline stabilization typically uses concrete, boulders, dimensional lumber or other materials to construct linear and nearly vertical structures and include, but are not limited to, bulkheads, rip-rap, groins, and similar structures.

Soft Structural Shoreline Stabilization means erosion control and restoration practices that contribute to restoration, protection or enhancement of shoreline ecological functions. Soft shoreline stabilization typically includes a mix of gravels, cobbles, boulders, logs and native vegetation placed to provide stability in a non-linear, sloping arrangement. Non-structural and “soft” structural stabilization measures can be cost-effective and practicable solutions.

ATTACHMENT 2

5.B.2.a. Applicability of Shoreline Stabilization Policies and Procedures

The provisions in this section apply to shoreline stabilization measures taken at or landward of the Ordinary High Water mark, and within the shoreline setback or floodplain whose purpose is to protect primary structures against erosion associated with shoreline processes. 5.B.2.b. Shoreline Stabilization Policies

POLICY SH-195. Allow for new hardened stabilization as the least favored alternative and only when no technically feasible alternative to avoidance and softened stabilization exists.

POLICY SH –196. Locate and design new development and provide flexibility in site design to eliminate the need for new shoreline stabilization.

POLICY SH-197. Promote through incentives the use of soft shoreline stabilization measures or other measures that incorporate innovative habitat restoration techniques.

POLICY SH-198. Existing legally established shoreline stabilization measures requiring replacement are presumed needed to protect existing shoreline uses and may be replaced provided that, at a minimum, non-vertical structural shoreline stabilization is used; however, soft structural shoreline stabilization is preferred.

POLICY SH-199. When a vertical or near-vertical bulkhead no longer adequately serves its purpose, the bulkhead may be replaced; provided that replacement with a new vertical bulkhead is prohibited unless replacement with a non-vertical structure is technically infeasible. **POLICY SH-200**. Existing vertical and near-vertical bulkheads supporting the artificial canals in the Shoreline Residential Canal environment may be repaired or replaced in their current configuration and design.

POLICY SH-201. Allow maintenance and repair of shoreline stabilization structures; provided that no expansion of the structure is allowed. Repair shall not include full replacement of a shoreline stabilization structure that can no longer adequately serve its purpose.

POLICY SH–202. Design, locate, size and construct new or replacement shoreline stabilization structures to avoid, and if avoidance is not possible, minimize and mitigate adverse impacts.

POLICY SH-203. Recognize the unique physical conditions of Phantom Lake and discourage shoreline stabilization measures.

5.B.2.c. Shoreline Stabilization Regulations (PROPOSED REGULATORY CONCEPTS)

- Incorporate and modify existing LUC standards in 20.25E for new shoreline stabilization. Develop standards addressing the siting, dimensional, and material requirements for new shoreline stabilization structures. Create a hierarchy to guide installation of new shoreline stabilization measures, allowing for hardened stabilization as the least favored alternative and only when no technically feasible alternative to avoidance and softened stabilization exists, as prioritized below:

i. Prefer avoidance;

ii. When avoidance is not possible due to conclusive evidence of physical constraint, soft shoreline stabilization measures may be implemented; and

iii. When soft stabilization is not technically feasible, a non-vertical hardened solution is permitted.

iv. New hardened vertical stabilization may only be permitted to protect water dependent uses and existing primary structures requiring structural support where non-vertical structures are found to be insufficient.

- Modify existing LUC standards in 20.25E to clarify that a total replacement of an existing stabilization measure is not required to demonstrate the need for some level of stabilization.
- Develop standards to locate development to eliminate or reduce the need for shoreline stabilization measures.
- Develop general design standards for shoreline stabilization measures.
- Develop standards addressing the repair and replacement of shoreline stabilization measures. These measures include relocation, softening, or non-vertical structures. When legally-established stabilization exists, it is presumed that stabilization is necessary for protection of shoreline uses.
- Develop standards for Phantom Lake considering the lake' s shoreline condition, including wetlands, floodplains, vegetation, that consider the physical conditions unique to this lake.
- Develop standards for the Shoreline Residential Canal environment allowing for the replacement of existing structural bulkheads in their current configuration and design.
- Develop incentives for softer shoreline stabilization and the use of innovative restoration techniques.
- Develop standard memorializing the OHWM when a hard shoreline stabilization measure is replaced with a soft shoreline stabilization measure.
- Develop definition for vertical stabilization.

5.B.8. Piers and Docks (Over Water Structures)

For the purpose of this section piers and docks include over-water structures used for moorage, boat-related, and other directly water-dependent uses or development, including docks, piers, boat launches, swimming/diving platforms, public access boardwalks, fishing piers, and viewpoints. As used here, a dock associated with a single family residence is a water dependent use provided that it is designed and intended as a facility for access to watercraft and otherwise complies with the provisions of the SMP.

ATTACHMENT 2

5.B.8.a. Applicability of Pier and Dock Policies and Regulations

The policies and regulations included in this section apply to piers and docks within shoreline jurisdiction.

5.B.8.b. Pier and Dock Policies

POLICY SH-223. Piers, docks, and floats should be allowed only for water-dependent uses (including residential uses) such as access to pleasure craft, recreation, commercial uses, and required emergency vessels.

POLICY SH-224. Allow for maintenance, repair, and reconfiguration of existing functional and legally established piers and docks.

POLICY SH-225. Provide incentives and flexible alternatives for dock and pier construction and maintenance to protect the near shore while allowing maximum flexibility to the dock and pier user.

POLICY SH-226: New pier and dock construction should be restricted to the minimum size necessary to meet the needs of the proposed water-dependent use.

POLICY SH-227: Piers and docks should be designed and constructed to avoid or to minimize and mitigate the impacts to ecological functions and processes.

POLICY SH-228: Encourage the consolidation and joint use of residential piers and docks. New residential development of two or more dwellings should provide joint use or community dock facilities.

POLICY SH-229: Design and locate private piers so that they do not interfere with shoreline recreational uses, navigation, or the public's safe use of the shoreline or water.

POLICY SH-230: New pier or dock construction, excluding docks accessory to single-family residences, should be permitted only when the applicant has demonstrated that a specific need exists to support the intended water-dependent use.

POLICY SH-231: Overwater structures shall be constructed of materials that have been approved by applicable state agencies.

POLICY SH-232: New covered moorage, boathouses, or other covered and enclosed moorage shall be prohibited, with the exception of boat canopies.

POLICY SH-233. Allow minor maintenance and repair of existing covered moorage, boathouses, or other covered and enclosed moorage.

POLICY SH-234: Consider tailored standards for docks and piers on Phantom Lake and in the Shoreline Residential Canal (SRC) district that address the unique characteristics of those areas.

POLICY SH-235: Allow docks and piers in Mercer Slough only when they provide public access and launching of human-powered watercraft.

POLICY SH-236. Allow for maintenance and preservation of historic, public overwater structures.

5.B.8.c. Pier and Dock Regulations (PROPOSED REGULATORY CONCEPTS)

Residential Moorage Regulatory Concepts

- Amend existing residential pier and dock provisions (LUC 20.25E.080.N) to provide additional flexibility for repair and replacement of existing docks and piers and focus on improvements in materials and design with a focus on the protection of near shore ecological functions.
- Simplify existing residential pier and dock provisions (LUC 20.25E.080.N) for new construction to focus on the protection of near shore ecological functions.
- Provide an administrative process to modify prescriptive standards that does not require a variance or conditional use.
- Develop separate dock and pier standards for the moorage facilities in Shoreline Residential Canal environment and Phantom Lake that reflect the unique circumstances and environmental conditions.

Marina and Non-Residential Moorage Regulatory Concepts

- Rewrite design standards for new and existing marinas and non-residential boating facilities to address new designs, aging facilities, and industry trends.
- Develop maintenance and repair standards for marinas and non-residential boating facilities.
- Develop standards for private and public boat launch facilities including staging, ramp, and dock requirements.
- Develop standards for overwater structures and non-boating recreational facilities that provide public access, such as viewing platforms, swimming/diving floats, boardwalks, and fishing structures.
- ~~Develop standards for off-shore moorage buoy fields.~~
- Develop standards for water-oriented transportation, such as ferries, water taxies, and float planes.

ATTACHMENT 3

Department of Ecology Comments received after July 14th Planning Commission meeting

1. At the June 9, 2010 Planning Commission meeting, there was testimony regarding the Ordinary High Water Mark (OHWM). The OHWM is defined at RCW 90.58.030(2)(b) which states:

   "Ordinary high water mark" on all lakes, streams, and tidal water is that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation as that condition exists on June 1, 1971, as it may naturally change thereafter, or as it may change thereafter in accordance with permits issued by a local government or the department: PROVIDED, That in any area where the ordinary high water mark cannot be found, the ordinary high water mark adjoining salt water shall be the line of mean higher high tide and the ordinary high water mark adjoining fresh water shall be the line of mean high water.

   The OHWM is a site specific determination. While Ecology has been supportive of administrative practices such as Bellevue's use of the Lake Sammamish OHWM study to facilitate project review and permitting, a Shoreline Master Program (SMP) cannot establish an OHWM for a specific water body. I encourage decision makers to focus on the policy and regulatory issues that are part of the SMP development.
2. During the Planning Commission meeting on July 14, several members of the public raised concern regarding the outlet weir for Phantom Lake. I note that shoreline management policies relating to the outlet need to addressed in the Cumulative Impact Analysis. Policies to alter the elevation of Phantom Lake could have notable impacts.
3. The staff report for the June 9, 2010 meeting included information from the Sammamish SMP. I caution that the Sammamish SMP is still early in the approval process. I do not recommend that decision-makers use the Sammamish SMP as an example at this time.
4. I encourage the Planning Commission to stay on schedule for making an SMP recommendation to the City Council. The original Shoreline Management Act deadline for adoption of this SMP was December 1, 2009. An extension is being processed for Bellevue to allow for submittal of a complete Draft SMP package to Ecology by December 1, 2010. I do not foresee additional extensions.
5. The Planning Commission is scheduled to discuss shoreline stabilization in the near future. The Guidelines are fairly prescriptive regarding shoreline stabilization standards. It may be helpful to have WAC 173-26-231(3)(a) available for the Planning Commission discussion of this topic. WAC 173-26-231(3)(a)(iii) may be particularly helpful.
6. The Planning Commission is scheduled to discuss piers and docks in the near future. It has been suggested that the City does not need to have specific pier and dock standards, but rather should rely on the United States Army Corps of Engineers (COE) review of pier and dock proposals to determine permit approvability. Ecology does not utilize COE permits to determine no net loss of ecological function. Ecology believes that utilizing the Regional General Permit (RGP) 3 standards on Lake Washington are a reasonable approach to achieve no net loss in a SMP with respect to piers and docks. We cannot guarantee that COE permits will follow the letter of RGP-3. Indeed, RGP-3 has expired. However, the concern and science underlying RGP-3 has not expired. In order to be approvable, the SMP needs to include specific standards to address the impacts of piers and docks.

after construction is completed. Dredging can also release toxic materials into the water column. As a result, dredging activities should be limited except when necessary for habitat or water quality restoration, or to restore access, and where impacts to habitat are minimized and mitigated.

Shoreline Stabilization

Policy SMP-10.6: Limit use of hard structural stabilization measures to reduce shoreline damage.

Lake Washington is an important migration and rearing area for juvenile Chinook salmon. The juvenile Chinook salmon using the Lake depend on the following habitat characteristics:

- Shoreline areas with shallow depths (>1m)
- Gentle slope
- Fine substrates such as sand and gravel
- Overhanging vegetation/small woody debris
- Small creeks with a shallow, low-gradient at the creek mouth [ii]

Remaining areas with these characteristics should be protected and maintained, while developed areas along Kirkland's shoreline should be enhanced with these habitat features, where feasible.

Bulkheads and other forms of hard stabilization measures impact the suitability of the shoreline for juvenile Chinook salmon habitat, in particular the slope, depth and substrate materials of the shoreline. Shoreline protective structures such as bulkheads create deeper water with steeper gradient and a coarser bottom substrate. Waves no longer are able to dissipate energy over distance as they hit shallower bottom, rocks, or shoreline vegetation. Rather, the wave reflects off a vertical wall, causing scouring of sediment at the base of the wall. The finer sands are removed as the gravel is eroded away and the bottom substrate becomes coarser. The result is a much deeper and steeper nearshore environment, and often elimination of a beach.

Despite these potential ecological impacts, there are some areas along the City's shoreline, especially on shallow lots with steep banks, which may need some form of shoreline armoring in order to protect existing structures and land uses. It is the intent of this policy to require that shoreline stabilization be accomplished through the use of nonstructural measures, such as building setbacks or on-site drainage improvements, or soft structural measures, such as bioengineering or beach enhancement unless these methods are determined to be infeasible, based on a scientific or geotechnical analysis. In those circumstances where alternatives are demonstrated to not be feasible, the shoreline stabilization measures used should be located, designed, and maintained in a manner that minimizes adverse effects on shoreline ecology.

Policy SMP-10.7: Design, locate, size and construct new or replacement structural shoreline protection structures to minimize and mitigate the impact of these activities on the Lake Washington shoreline.

Shoreline protective structures should be allowed to protect a legally established structure or use that is in danger of loss or substantial damage. The potential for damage must be conclusively shown, as documented by a geotechnical analysis, to be caused by shoreline erosion associated with wave action.

Where allowed, shoreline protection structures should minimize impacts on shoreline hydrology, navigation, habitat, and public access. Shoreline protective structures should be designed for the minimum height, bulk and extent necessary to address an identified hazard to an existing structure. As noted above, vegetation and nonstructural solutions should be used rather than structural bank reinforcement, unless these methods are determined to be infeasible, as documented by a geotechnical analysis.

Policy SMP-10.8: Locate and design new development to eliminate the need for new shoreline modification or stabilization.

New development should be located and designed so that new structural shoreline protection features are not needed.

Policy SMP-10.9: Encourage salmon friendly shoreline design during new construction and redevelopment by offering incentives and regulatory flexibility to improve the design of shoreline protective structures and revegetate shorelines.

In recent years, many bioengineered techniques have been developed to provide alternative shoreline protection methods. These features may employ the use of gravel substrate material, terraces, large flat rocks, shallow pools, logs, and vegetation to prevent erosion and provide an attractive, usable shoreline. The aim of these designs is to reduce bank hardening, restore overhanging riparian vegetation, and replace bulkheads with sand beaches and gentle slopes. These techniques can provide many ecological benefits, including:

- Less turbulence.
- Shallower grade.
- Protection from predators.
- Finer sandy bottom.
- Increased food source.

The WRIA 8 Conservation Strategy notes the importance of reducing bank hardening, restoring overhanging riparian vegetation, replacing bulkheads and riprap with sandy beaches with gentle slopes to improve the habitat for juvenile Chinook salmon[iii]. In order to facilitate the use of alternatives to shoreline stabilization composed of concrete, riprap, or other hard structural or engineered materials, the City should identify appropriate regulatory flexibility or offer incentives to shoreline property owners to voluntarily remove bulkheads and to re-vegetate the shoreline.

Policy SMP-10.11: Expand outreach to lakeside property owners about shoreline landscape design, maintenance, and armoring alternatives.

The City should evaluate different outreach and education actions to foster stewardship of shoreline property owners and the general public, including, but not limited to the following:

- Distribute educational materials on a range of topics, including salmon habitat needs, household and landscape best management practices, the value of large woody debris, the value of tree cover, and stormwater issues.
- Establish a contact list of shoreline property owners to facilitate educational outreach.
- Offer shoreline property owners workshops on "salmon friendly" design

- Use restoration projects sites for demonstration purposes and provide interpretation at restoration sites, including signage, tours, and other methods.
- Provide information about opportunities for involvement in community stewardship projects
- Offer education to landscape designers/contractors on riparian design.
- Create local informational TV spots that could run on the City's television channel.
- Focus environmental/science curricula on local watershed issues.

Public outreach efforts should focus on the opportunity to improve existing habitat, but also to the potential benefits that alternative shoreline stabilization can offer, including:

- Easier access to beach and water, especially with a kayak or other human-powered craft.
- Shallow gradient shore and water can be safer, especially for small children.
- More usable shoreline with beach and cove.
- Reduced maintenance.
- Potential for increased property values.

In-stream Structures

Policy SMP-10.12: Limit the use of in-stream structures.

"In-stream structure" means a structure placed by humans within a stream waterward of the ordinary high water mark that either causes or has the potential to cause water impoundment or the diversion, obstruction, or modification of water flow. Within Kirkland, these features typically include those for flood control, transportation, utility service transmission, and fish habitat enhancement.

In-stream structures should only be used in those circumstances where it is demonstrated to 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 should be determined with 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.

Breakwaters and Similar Features

Policy SMP-10.13: Limit the use of breakwaters and other similar structures..

A breakwater typically refers to an off-shore structure designed to absorb and/or reflect wave energy back into the water body. Breakwaters can be floating or fixed in location and may or may not be connected to the shore. These modifications are limited within the City, but can be found at Kirkland Homeport Marina as well as at Juanita Beach Park, where a breakwater has been installed around the overwater boardwalk to shelter the swimming area. Breakwaters have the potential to adversely impact the shoreline environment, including impacts to sediment transport, deflection of wave energy, a decrease in water flushing and water exchange, to name a few. As a result, the installation of new breakwaters should be limited to those circumstances when it is shown to be necessary to support water-dependent uses, public access, shoreline stabilization, or other specific public purpose.

In these circumstances, the feature should be carefully designed to avoid, minimize, and then mitigate any adverse ecological impacts.

Piers

Goal SMP-11: Minimize impacts to the natural environment and neighboring uses from new or renovated piers.

Policy SMP-11.1: Design and locate private piers so that they do not interfere with shoreline recreational uses, navigation, or the public's safe use of the Lake and shoreline.

Private piers should be located and designed to provide adequate separation from public parks, other adjoining moorage facilities and adjacent properties in order to limit any adverse impacts to safe navigation or recreational uses.

Policy SMP-11.2: Design and construct new or expanded piers and their accessory components, such as boatlifts and canopies, to minimize impacts on native fish and wildlife and their habitat.

The Kirkland waterfront has been extensively modified with piers and other overwater structures. These overwater structures impact the nearshore aquatic habitat, blocking sunlight and creating large areas of overhead cover. Piers and other overwater structures also shade the lake bottom and inhibit the growth of aquatic vegetation[iv]. These types of structural modifications to shorelines are now known to benefit non-native predators (like largemouth and smallmouth bass), while reducing the amount of complex aquatic habitat formerly available to salmonids rearing and migrating through Lake Washington[v]. This can impact juvenile salmonids, in particular, due to their affinity to nearshore, shallow-water habitats. Chemical treatments of pier components, such as creosote pilings, installed prior to today's standards, have also impacted water and sediment quality in the lake.

The combined effect of an overwater structure and a dramatic change in aquatic vegetation results in a behavior modification in juvenile salmonids, which will often change course to circumvent large piers or other overwater structures rather than swimming beneath them[vi]. These behavior modifications disrupt natural patterns of migration and can expose juvenile salmonids to increased levels of predation.

Minimizing overwater coverage and associated support structures can benefit salmon. Studies related to shading effects from varying types of pier decking indicate that grated decking provides significantly more light to the water surface than traditional decking methods and may lead to improved migratory conditions for juvenile Chinook salmon[vii].

Impact minimization measures, which have been identified by state and federal agencies, include, but are not limited to:

- Shared use of piers;
- Reducing or eliminating the number of boathouses and solid moorage covers (e.g. use of clear, translucent materials proven to allow light transmission for new canopies);
- Minimizing the size and widths of piers and floats;
- Increasing light transmission through any over-water structures (e.g. use of grated decking);
- Maximizing the height of piers above the water surface;

- Enhancing the shoreline with native vegetation;
- Improving shallow-water habitat;
- Reducing the overall number and size of pier piles; and
- Improving the quality of stormwater runoff.

Policy SMP-11.3: Minimize aesthetic impacts of piers and their accessory components.

To minimize aesthetic impacts, ensure that lighting does not spillover onto the lake water surface, and minimize glare, piers should make use of non-reflective materials, minimize lighting facilities to that necessary to find the pier at night and focus illumination downward and away from the lake.

Shoreline Habitat and Natural Systems Enhancement Projects

Goal SMP-12: Restore shoreline areas that have been degraded or diminished in ecological value and function as a result of past activities.

Policy SMP-12.1: Include provisions for shoreline vegetation restoration, fish and wildlife habitat enhancement, and low impact development techniques in projects located within the shoreline, where feasible.

Shoreline habitat and natural systems enhancement projects include those activities proposed and conducted specifically for the purpose of establishing, restoring, or enhancing habitat for priority species in shorelines. Such projects may include shoreline modification actions such as modification of vegetation, removal of nonnative or invasive plants, shoreline stabilization, dredging, and filling, provided that the primary purpose of such actions is clearly restoration of the natural character and ecological functions of the shoreline.

The City's shoreline has been impacted by past actions and, as a result, there are many opportunities available for restoration activities that would improve ecological functions. For example, enhancement of riparian vegetation, reductions or modifications to shoreline hardening, and improvements to fish passage would improve the ecological function of the City's shoreline. Many of these restoration opportunities exist throughout the City on private property, as well as on City property, including parks, open spaces, and street-ends. Both public and private efforts are needed to restore habitat areas. Opportunities include public-private partnerships, partnerships with other agencies and affected tribes, capital improvement projects, and incentives for private development to restore and enhance fish and wildlife habitat.

2. Shoreline Environment

Goal SMP-13: Preserve, protect, and restore the shoreline environment.

Kirkland is enriched with valued natural features within the shoreline area that enhance the quality of life for the community. Natural systems serve many essential functions that can provide significant benefits to fish and wildlife, public and private property, and enjoyment of the shoreline area.

Shoreline Critical Areas

Shoreline Modification Regulations

83.260 General

1. See KZC 83.360 for no net loss standard and mitigation sequencing.
2. See KZC 83.370 for federal and state approval required prior to submittal of a building permit.
3. See KZC 83.430 for in water construction.
4. Structures must be designed to preclude moorage in locations that would have insufficient water depth to avoid boats resting on the substrate at any time of year.

83.270 Piers, Docks, Moorage Buoys and Piles, Boatlifts and Boat Canopies Serving a Detached Dwelling Unit Use (Single-family)

1. General –
   a. Piers, Docks, Moorage Buoys and Piles, Boatlifts and Canopies may only be developed and used accessory to existing dwelling units on waterfront lots or upland lots with waterfront access rights. Use of these structures is limited to the residents and guests of the waterfront lots to which the moorage is accessory. Moorage space shall not be leased, rented, or sold unless otherwise approved as a Marina under the provisions of KZC 83.290.
   b. In the following circumstances, a joint use pier shall be required:
      1) On lots subdivided to create additional lots with waterfront access rights.
      2) New residential development of two or more dwelling units with waterfront access rights.
   c. Piers, docks, boatlifts and moorage piles shall be designed and located to meet KZC 83.360 for no net loss standard and mitigation sequencing.
   d. For proposed extension of structures proposed waterward of the Inner Harbor Lines, see KZC 83.370.
2. Setbacks
   a. All piers, docks, boatlifts and moorage piles for Detached Dwelling Unit Use shall comply with the following location standards:

New Pier, Dock, Boatlift and Moorage Pile for Detached Dwelling Unit	Minimum Setback Standards
Side property lines	5 ft for moorage pile; otherwise 10 ft.
Another moorage structure not on the subject property, excluding adjacent moorage structure that does not comply with required side property line setback	25 ft., except that this standard shall not apply to moorage piles
Outlet of a stream regulated under KZC 90, including piped streams	Maximum distance feasible while meeting other required setback standards established under this section
Public park	25 ft., except that this standard shall not apply within the Urban Mixed shoreline environment.

   b. Joint-use structures may abut property lines provided the property owners sharing the moorage facility have mutually agreed to the structure location. To insure that a pier is shared, each property owner must sign a statement in a form acceptable to the City Attorney,

stating that the pier or dock is used by the other property. The applicant must file this statement with the King County Recorder's Office to run with the properties.

3. General Standards –

   a. Proposed piers and docks that do not comply with the dimensional standards contained in this section or cannot be permitted through the Administrative Approval for Alternative Design process in this section may only be approved if they obtain a shoreline variance under the provisions of KZC Chapter 141.70.3.

   b. All piers and docks and other developments regulated by this section shall be constructed and maintained in a safe and sound condition. Abandoned or unsafe structures shall be removed or repaired promptly by the owner.

   c. Temporary moorages shall be permitted for vessels used in the construction of shoreline facilities. The design and construction of temporary moorages shall be such that upon termination of the project, the aquatic habitat in the affected area can be returned to its original (pre-construction) condition.

   d. The following structures and improvements are not permitted:

      a) Covered moorage, boathouses, or other walled covered moorage, except boat canopies that comply with the standards in this subsection.

      b) Skirting on any structure

      c) Aircraft moorage

   e. See KZC 83.470 Lighting Standards for required lighting.

   f. Piers and docks must display the street address of the subject property. The address must be oriented to the lake with letters and numbers at least 4 inches high.

   g. Piers and docks shall be marked with reflectors, or otherwise identified to prevent unnecessarily hazardous conditions for water surface users during the day or night. Exterior finish of all structures and windows shall be generally non-reflective.

   h. Must provide at least one (1) covered and secured waste receptacle.

   i. All utility and service lines located waterward of the OHWM must be below the pier deck. All utility and service lines located upland of the OHWM shall be underground, where feasible.

4. New Pier or Dock Dimensional Standards –

   a. New piers or docks may be permitted, subject to the following regulations:

New Pier, Dock or Moorage Piles for Detached Dwelling Unit (single family)	**Dimensional and Design Standards**
Maximum Area: surface coverage, including all attached float decking, ramps, ells and fingers	480 sq. ft. for single property owner 700 sq. ft. for joint-use facility used by 2 residential property owners 1000 sq. ft. for joint-use facility used by 3 or more residential property owners These area limitations shall include platform lifts. Where a pier cannot reasonably be constructed under the area limitation above to obtain a moorage depth of 10 ft. measured above

	ordinary high water, an additional 4 sq. ft. of area may be added for each additional foot of pier length needed to reach 10 ft. of water depth.
Maximum Length for piers, docks, ells, fingers and attached floats	150 ft, but piers or docks extending further waterward than adjacent piers or docks must demonstrate that they will not have an adverse impact on navigation. 26 ft. for ells 20 ft. for fingers and float decking attached to a pier
Maximum Width	4 ft. for pier or dock 6 ft. for ells 2 ft. for fingers 6 ft. for float decking attached to a pier, must contain a minimum of 2 ft. of grating down the center of the entire float. For piers or docks with no ells or fingers, the most waterward 26 ft. section of the walkway may be 6 ft. wide
Height of piers and diving boards	Minimum of 1.5 ft. above ordinary high water to bottom of pier stringers, except the floating section of a dock and float decking attached to a pier Maximum of 3 feet above deck surface for diving boards or similar features Maximum of 3 feet above deck for safety railing, which shall be an open framework
Minimum Water Depth for ells and float decking attached to a pier	Must be in water with depths of 9 ft. or greater at the landward end of the ell or finger. Must be in water with depths of 10 ft. or greater at the landward end of the float
Decking for piers, docks walkways, platform lifts, ells and fingers	Piers and docks and platform lifts must be fully grated or contain other materials that allow a minimum of 40% light transmittance through the material. If float tubs for docks preclude use of fully grated decking material, then a minimum of 2 ft. of grating down the center of the entire float shall be provided.
Location of ells, fingers and deck platforms	No closer than 30 ft. waterward of the OHWM Within 30 ft. of the OHWM, only the access ramp portion of pier or dock is allowed
Pilings, Moorage Piles, and Buoys	Piles shall not be treated with pentachlorophenol, creosote, chromated copper arsenate (CCA) or comparably toxic compounds. First set of piles located no closer than 18 ft from OHWM Maximum 2 moorage piles or buoys per detached dwelling unit, including existing piles Maximum 4 moorage piles or buoys for joint use piers or docks, including existing piles
Mitigation	Plantings or other mitigation as described below in KZC 83.270.5

b. The City shall approve the following modifications to a new pier proposal that deviates from

the dimensional standards of KZC 83.270.4, subject to both U.S Army Corps of Engineer and Washington Department of Fish and Wildlife approval to an alternate project design. In addition, the following requirements and all other applicable provisions in this Chapter shall be met.

Administrative Approval for Alternative Design of New Pier or Dock for Detached Dwelling Unit (single family)	**Requirements**
State and Federal Agency Approval	U.S. Army Corps of Engineers, and the Washington Department of Fish and Wildlife have approved proposal.
Maximum Area	No larger than authorized through state and federal approval
Maximum Width	4 ft. for portion of pier or dock located within 30 ft. of the OHWM; otherwise, 6 ft. for walkways Otherwise, the pier and all components shall meet the standards noted in KZC 83.270.4
Minimum Water Depth	No shallower than authorized through state and federal approval

With submittal of a building permit, the applicant shall provide documentation that the U.S. Army Corps of Engineers, and the Washington Department of Fish and Wildlife have approved the alternative proposal design.

5. Mitigation. All proposals involving new piers or docks are subject to the following mitigation requirements:

   1) Any existing in-water and overwater structures shall be removed if they are associated with either a moorage structure or other recreational use that is located within 30 feet of the OHWM.

   2) Emergent vegetation shall be planted waterward of the OHWM, unless the City determines that it is not appropriate or feasible.

   3) Native riparian vegetation shall be planted in at least 75 percent of the nearshore riparian area located along the water's edge. The vegetated portion of the nearshore riparian area shall average ten (10) feet in depth from the OHWM, but may be a minimum of five (5) feet wide to allow for variation in landscape bed shape and plant placement. Joint-use piers required under the provisions of this Chapter shall require a vegetative riparian zone along all properties sharing the pier. Other joint-use piers shall be required to provide the same mitigation as required for one property, which can be slit evenly between the subject properties.

   4) Mitigation plantings shall be subject to the following requirements:

      a) Restoration of native vegetation shall consist of a mixture of trees, shrubs and groundcover and be designed to improve habitat functions. At least three (3) trees per 100 linear feet of shoreline and 60% shrubs must be included in the plan. Plant materials must be native and selected from the Kirkland Native Plant List, or other native or shoreline appropriate species approved by the Planning Official or Urban Forester. Plant density and spacing shall be appropriate for the site and commensurate with spacing recommended for each individual species proposed. An alternative planting plan or mitigation measure in lieu of meeting these requirements

shall be allowed if approved by other state and federal agencies.

In addition, the City shall accept existing native trees, shrubs and groundcover as meeting the requirements of this section, including vegetation previously installed as part of a prior development activity, provided that the existing vegetation provides a landscape strip at least as effective in protecting shoreline ecological functions as the required vegetation.

b) Vegetation placement – See the provisions contained in KZC 83.400, including the vegetation placement and alternative compliance provisions.

5) In addition to a native planting plan, a 5-year vegetation maintenance and monitoring plan shall be submitted to the City for approval. The monitoring plan shall include the following performance standards:

a) Preparation of as-built drawings after installation of the mitigation plantings;

b) Annual monitoring reports for 5 years, that include written and photographic documentation on tree and shrub mortality, subject to the following success criteria:

i. One-hundred (100) percent survival of all planted native trees and shrubs during the first two (2) years after planting; and

ii. One hundred (100) percent survival of trees and eighty (80) percent survival of remaining native plants in years three (3) through five (5).

Copies of reports that are submitted to state or federal agencies in compliance with permit approvals may be submitted in lieu of a separate report to the City, provided that the reports address a 5-year maintenance and monitoring plan.

6) Woody debris existing on-site or contributed to the site as part of the mitigation efforts shall not be removed.

6. Replacement of Existing Pier or Dock –

a. A replacement of an existing pier or dock shall meet the following requirements:

Replacement of Existing Pier or Dock for Detached Dwelling Unit (single family)	**Requirements**
Replacement of entire existing pier or dock, including piles OR more than 50 percent of the pier-support piles and more than 50 percent of the decking or decking substructure (e.g. stringers)	Must meet the dimensional decking and design standards for new piers as described in KZC 83.270.4, except the City may administratively approve an alternative design described in subsection b. below.
Mitigation	Existing skirting shall be removed and may not be replaced. Existing in-water and overwater structures located within 30 feet of the OHWM, except for existing or authorized shoreline stabilization measures, shall be removed.

b. Alternative Design - The City shall approve the following modifications to a pier replacement proposal that deviates from the dimensional standards of KZC 83.270.4, subject to both U.S Army Corps of Engineer and Washington Department of Fish and Wildlife approval to an alternate project design. In addition, the following requirements and all other applicable provisions in this Chapter shall be met.

Administrative Approval for Alternative Design of Replacement Pier or Dock for Detached Dwelling Unit	Requirements
State and Federal Agency Approval	U.S. Army Corps of Engineers and the Washington Department of Fish and Wildlife have approved proposal.
Maximum Area	No larger than existing pier
Maximum Length	26 ft. for fingers and float decking attached to a pier Otherwise, the pier and all components shall meet the standards noted in KZC 83.270.4
Maximum Width	4 ft. for portion of pier or dock located within 30 ft. of the OHWM; otherwise, 6 ft. for walkways 8 ft. for ells and float decking attached to a pier For piers with no ells or fingers, the most waterward 26 ft. section of the walkway may be 8 ft. wide Otherwise, the pier and all components shall meet the standards noted in KZC 83.270.4
Minimum Water Depth	No shallower than authorized through state and federal approval

With submittal of a building permit, the applicant shall provide documentation that the U.S. Army Corps of Engineers, and the Washington Department of Fish and Wildlife have approved the alternative proposal design.

7. Additions to Pier or Dock –

Proposals involving the modification and/or enlargement of existing piers or docks must comply with the following requirements:

Addition to Existing Pier or Dock for Detached Dwelling Unit (single family)	Requirements
Addition or enlargement	Must demonstrate that there is a need for the enlargement of an existing pier or dock. Examples of need include, but are not limited to safety concerns or inadequate depth of water.
Dimensional standards	Enlarged portions must comply with the new pier or dock standards for length and width, height, water depth, location, decking and pilings and for materials as described in KZC

	83.270.
Decking for piers, docks walkways, ells and fingers	Must convert an area of existing nearshore decking to grated decking equivalent in size to the additional surface coverage. Grated or other materials must allow a minimum of 40% light transmittance through the material.
Mitigation	Planting and other mitigation as described in KZC 83.270.5 Existing skirting shall be removed and may not be replaced. Existing in-water and overwater structures located within 30 ft. of the OHWM, except for existing or authorized shoreline stabilization measures or pier or docks, shall be removed at a 1:1 ratio to the area of the addition

8. Repair of Existing Pier or Dock–

a. Repair proposals that replace only decking or decking substructure and less than 50 percent of the existing pier-support piles must comply with the following regulations:

Minor Repair of Existing Pier or Dock for Detached Dwelling Unit (single family)	**Requirements**
Replacement piles	Must use materials as described under KZC 83.270.5 Must minimize the size of piles and maximize the spacing between pilings to the extent allowed by site-specific engineering or design considerations
Replacement of 50 percent or more of the decking or 50 percent or more of decking substructure	Must replace any solid decking surface located within the nearshore 30 ft. of the pier or dock with a grated surface material that allows a minimum of 40% light transmittance through the material.

b. Other repairs to existing legally established moorage facilities where the nature of the repair is not described in the above subsections shall be considered minor repairs and are permitted, consistent with all other applicable codes and regulations. If cumulative repairs of an existing pier or dock would make a proposed repair exceeds the threshold for a replacement pier established in KZC 83.270.5 above, the repair proposal shall be reviewed under KZC 83.270.4 for a new pier or dock, except as described in KZC 83.270.5.b for

administrative approval of alternative design.

9. Boatlifts, Boatlift Canopies and Moorage Piles –

Boatlifts, boatlift canopies and moorage piles may be permitted as an accessory to piers and docks, subject to the following regulations:

Boatlift, Boat Canopy and Moorages Buoy for Detached Dwelling Unit (single family)	**Requirements**
Location	Boat lifts shall placed as far waterward of the OHWM as feasible and safe, within the limits of the dimensional standards for piers established in KZC 83.270.4 Bottom of a boatlift canopy shall be elevated above the boatlift to the maximum extent feasible, the lowest edge of the canopy must be a least 4 ft. above the ordinary high water, and the top of the canopy must not extend more than 7 ft. above an associated pier. Moorage piles or buoys shall not be closer than 30 ft. from OHWM or any farther waterward than the end of the pier or dock
Maximum Number	1 free-standing or deck-mounted boatlift per detached dwelling unit 2 jet ski lifts or 1 fully grated platform lift per detached dwelling unit use 1 boatlift canopy per detached dwelling unit, including joint use piers 2 moorage piles per detached dwelling unit, including existing piles 4 moorage piles for joint use piers or docks, including existing piles
Canopy Materials	Must be made of translucent fabric materials. Must not be constructed of permanent structural material.
Fill for Boatlift	Maximum of 2 cubic yards of fill are permitted to anchor a boatlift, subject to the following requirements: • May only be used if the substrate prevents the use of anchoring devices that can be embedded into the substrate • Must be clean • Must consist of rock or pre-cast concrete blocks • Must only be used to anchor the boatlift

	• Minimum amount of fill is utilized to anchor the boatlift

83.280 Piers, Docks, Boat lifts and Canopies Serving Detached, Attached or Stacked Dwelling Units (Multi-family)

1. General –

   a. Piers, Docks, Moorage Buoy and Piles, Boatlifts and Canopies may only be developed and used accessory to existing dwelling units on waterfront lots or upland lots with waterfront access rights. Use of these structures is limited to the residents and guests of the waterfront lots to which the moorage is accessory. Moorage space shall not be leased, rented, or sold unless otherwise approved as a Marina under the provisions of KZC 83.290.

   b. Piers, docks, boatlifts and moorage piles shall be designed and located to meet KZC 83.360 Mitigation Sequencing.

   c. See KZC 83.370 for structures to be extended waterward of the Inner Harbor Line.

2. Setbacks –

   All piers, docks, boatlifts and moorage piles serving Detached, Attached or Stacked Dwelling Units shall comply with the following setback standards:

New Pier, Dock, Boatlift and Moorage Pile for Detached, Attached or Stacked Dwelling Units (multi-family)	**Minimum Setback Standards**
Side property lines	5 ft for moorage pile; otherwise 10 ft.
Lot containing a detached dwelling unit	The area defined by a line that starts where the OHWM of the lot intersects the side property line of the lot closest to the moorage structure and runs waterward toward the moorage structure and extends at a 30° angle from that side property line. This setback applies whether or not the subject property abuts the lot, but does not extend beyond any intervening overwater structure. This standard shall not apply within the Urban Mixed shoreline environment.
Another moorage structure not on the subject property, excluding adjacent moorage structure that does not comply with required north and south property line setback	25 ft., except that this provision shall not apply to moorage piles
Outlet of a stream regulated under KZC 90, including piped streams	Maximum distance feasible while meeting other required setback standards established under this section
Public park	100 feet; or The area defined by a line that starts where the OHWM of the park intersects with the side property line of the park closest to the moorage structure and extends at a 45°

b. An assessment of the impacts and measures taken to avoid, minimize, and mitigate impacts. See KZC 83.360 for mitigation sequencing.

83.300 Shoreline Stabilization

1. General -

a. The standards in this section apply to all developments and uses in shoreline jurisdiction.

b. New development or redevelopment shall be located and designed to avoid the need for new or future soft or hard structural shoreline stabilization to the extent feasible.

c. If structural stabilization is necessary to protect the primary structure, then the feasibility of soft structural measures shall be evaluated prior to consideration of hard structural measures. Soft structural stabilization measures must be used unless the City determines that it is not feasible based on information required in this section and provided by the applicant.

d. Soft shoreline stabilization may include the use of gravels, cobbles, boulders, and logs, as well as vegetation.

e. Plate XX provides guidance on different shoreline stabilization measures that may be considered, based upon the unique characteristics of the subject property and shoreline.

f. During construction or repair work on a shoreline stabilization measure, areas of temporary disturbance within the shoreline setback shall be restored as quickly as feasible to their pre-disturbance condition or better to avoid impacts to the ecological function of the shoreline. Also see KZC 83.430 for in-water construction activity.

g. The following is a summary of the key requirements found in KZC 83.300.2 through KZC 83.300.7:

Shoreline Stabilization Measures	Requirements
Structural and Nonstructural Methods	Nonstructural methods preferred, but if there is a demonstrated need for a structural stabilization measure to protect primary structure, then soft structural stabilization must be considered prior to hard structural stabilization.
New or Enlargement of Hard Shoreline Structural Measures (enlargement includes additions and increases in size, such as height, width, length, or depth, to existing shoreline stabilization measures)	Allowed when existing primary structure is 10 ft. or less from OHWM When existing primary structure is greater than 10 ft. from OHWM, requires geotechnical report to show need, an evaluation of the feasibility of soft rather than hard structural shoreline stabilization measures and design recommendations for minimizing structural shoreline measures. Requires mitigation plantings
Major Repair or Replacement of Hard Shoreline Structural Measures	A major repair is a collapsed or eroded structure or a demonstrated loss of structural integrity, or repair of toe rock or footings; and is more than 50% in continuous linear length; or A major repair is repair to more than 75%

	of the linear length of structure that involves replacement of top or middle course rocks or other similar repair Allowed when existing primary structure is 10 ft. or less from OHWM For existing primary structure is more than 10 ft. from the OHWM, requires a written narrative that provides a demonstration of need
Minor Repair of Hard Shoreline Stabilization Measure	Does not meet threshold of new, enlarged, major repair or replacement measurement. No geotechnical report or needs assessment required.
New, Enlarged, Repair or Replacement of Soft Shoreline Stabilization Measure	Allowed when existing primary structure is 10 ft. or less from OHWM or for repair or replacement. For primary structure greater than 10 ft. from the OHWM, new or enlarged requires a written narrative that provides a demonstration of need

2. New or Enlarged Structural Shoreline Stabilization –

a. For the purposes of this section, enlargement of an existing structural stabilization shall include additions to or increases in size (such as height, width, length, or depth). Primary structure includes appurtenances listed under WAC 173-14-040, but not tool sheds, greenhouses, swimming pools, spas and other ancillary residential improvements listed in KZC 83.80.5.

b. When allowed:

The City may only approve a new or enlarged hard or soft structural stabilization measure in the following circumstances:

1) To protect an existing primary structure, including a detached dwelling unit, in either of the following circumstances:

a) The existing primary structure is located ten (10) feet or less from the OHWM. For the purposes of the provision, the distance shall be measured to the most waterward location of the primary structure, or

b) The existing primary structure is located more than ten (10) feet from the OHWM.

In order to be approved, the applicant must demonstrate the following:

i. For new or enlarged hard structural stabilization, conclusive evidence, documented by a geotechnical analysis, that the primary structure is in danger from shoreline erosion caused by waves. The analysis must show that there is a significant possibility that an existing structure will be damaged within three (3) years as a result of shoreline erosion in the absence of hard structural stabilization measures, or where waiting until the need is immediate results in the loss of opportunity to use measures that would avoid impacts on ecological functions. Where the geotechnical report confirms a need to prevent potential damage to a primary structure, but the need is not as immediate as three (3) years, the report may still be

used to justify more immediate authorization to protect against erosion using soft structural stabilization measures.

ii. For new soft structural stabilization measures, demonstrate need for structural stabilization to protect the new primary structure.

iii. For hard and soft stabilization measures, any on-site drainage issues have been directed away from the shoreline edge prior to considering structural stabilization.

iv. For hard and soft shoreline stabilization measures, nonstructural measures, such as planting vegetation, or installing on-site drainage improvements are shown not to be feasible or sufficient to protect the primary structure.

2) To protect a new primary structure, including a detached dwelling unit, when all of the conditions below apply:

a) For new non water-dependant uses, placing the new primary structure farther upland from the OHWM is not feasible or not sufficient to prevent damage to the primary structure;

b) Upland conditions, such as drainage problems and the loss of vegetation, are not causing the erosion;

c) Nonstructural measures, planting vegetation, or installing on-site drainage improvements are shown not to be feasible or sufficient to prevent damage to the primary structure; and

d) The need to protect the new primary structures from potential damage is due to erosion from wave action. For hard structural stabilization measures, a geotechnical report must be submitted demonstrating need. For soft structural stabilization measures, an assessment by a qualified professional must be submitted demonstrating need.

3) To protect projects for the restoration of ecological functions or for hazardous substance remediation projects pursuant to Chapter 70.105D RCW when nonstructural measures, planting vegetation, or installing on-site drainage improvements, are not feasible or not sufficient.

3. Submittal Requirements for New or Enlarged Structural Stabilization Measures -

In addition to the requirements described in KZC 83.300.2 above, the following shall be submitted to the City for an existing primary structure more than 10 feet from the OHWM or for a new primary structure:

a. For a hard structural shoreline stabilization measure, a geotechnical report prepared by a qualified professional with an engineering degree. The report shall include the following:

1) An assessment of the necessity for hard structural stabilization by estimating time frames and rates of erosion and documenting the urgency associated with the specific situation.

2) An assessment of the cause of erosion, looking at processes occurring both waterward and landward of the OHWM.

b. An assessment prepared by a qualified professional (e.g., shoreline designer or other consultant familiar with lakeshore processes and shore stabilization), containing the following:

1) For a hard structural shoreline stabilization measure, an evaluation of the feasibility of using soft shoreline stabilization measures in lieu of hard structural shoreline stabilization measures. The evaluation shall address the feasibility of implementing options presented in Plate XX based on an assessment of the subject property's characteristics.

2) For a soft structural stabilization measure, an assessment of:

a) The erosion potential resulting from the action of waves or other natural processes operating at or waterward of the OHWM in the absence of the soft structural stabilization.

b) The feasibility of using nonstructural measures in lieu of soft structural shoreline stabilization measures.

3) For both hard and soft structural shoreline stabilization measures, design recommendations for minimum the sizing of shoreline stabilization materials, including gravel and cobble beach substrates necessary to dissipate wave energy, eliminate scour, and provide long-term shoreline stability.

4) See additional submittal requirements below in subsections 8, 9 and 10 for general submittal requirements, maintenance agreement and general design standards.

4. Replacement or Major Repair of Hard Structural Shoreline Stabilization -

a. For the purposes of this section, major repair or replacement of a hard shoreline stabilization measure shall include the following activities:

1) A repair needed to a portion of an existing stabilization structure that has collapsed, eroded away or otherwise demonstrated a loss of structural integrity, or in which the repair work involves modification of the toe rock or footings, and the repair is 50 percent or greater than the linear length of the shoreline stabilization measure; or

2) A repair to more than 75 percent of the linear length of the existing hard structural shoreline stabilization measure in which the repair work involves replacement of top or middle course rocks or other similar repair activities.

b. When allowed -

The City may only approve a major repair or replacement of an existing hard structural stabilization measure with a hard structural shoreline stabilization measure to protect existing primary structures or principal uses, including detached dwelling units, in either of the following circumstances:

1) The primary structure is located 10 feet or less from the OHWM. For the purposes of the provision, the distance shall be measured to the most waterward location of the primary structure; or

2) For a primary structure located more than 10 feet from the OHWM or a use, conclusive evidence is provided to the City that the primary structure or use is in danger from shoreline erosion caused by waves as required in KZC 83.300.5 below.

5. Submittal Requirements for Major Repairs or Replacements of Hard Stabilization Measures -

The following shall be submitted to the City when the primary structure is located more than 10 feet landward of the OHWM or for a use with no primary structure:

a. Written narrative that provides a demonstration of need shall be submitted. A qualified professional (e.g., shoreline designer or other consultant familiar with lakeshore processes and shore stabilization), but not necessarily a licensed geotechnical engineer shall prepare a written narrative. The written narrative shall consist of the following:

1) An assessment of the necessity for hard structural stabilization, considering site-specific conditions such as water depth, orientation of the shoreline, wave fetch, and location of the nearest structure. The evaluation shall address the feasibility of implementing options presented in Plate XX, given an assessment of the subject property's characteristics.

2) An assessment of erosion potential resulting from the action of waves or other natural processes operating at or waterward of the OHWM in the absence of the hard structural shoreline stabilization.

3) An assessment of the feasibility of using soft structural stabilization measures in lieu of hard structural shoreline stabilization measures. Soft stabilization may include the use of gravels, cobbles, boulders, and logs, as well as vegetation.

b. Design recommendations for minimizing impacts and ensuring that the replacement or repaired stabilization measure is designed, located, sized, and constructed to assure no net loss of ecological functions.

c. See additional submittal requirements below in subsections 8, 9 and 10 for general submittal requirements, maintenance agreement and general design standards.

6. Minor Repairs of Hard Shoreline Stabilization –

Minor repairs of hard shoreline stabilization include those maintenance and repair activities not otherwise addressed in the subsection above. The City shall allow minor repair activities to existing hard structural shoreline stabilization measures.

7. Repair or Replacement of Soft Shoreline Stabilization and Submittal Requirements –

a. The City shall allow repair or replacement of soft shoreline stabilization.

b. The applicant shall submit to the City design recommendations for minimizing impacts and ensuring that the replacement or repaired stabilization measure is designed, located, sized, and constructed to assure no net loss of ecological functions.

c. See additional submittal requirements below in subsections 8, 9 and 10 for general submittal requirements, maintenance agreement and general design standards.

8. General Submittal Requirements for New, Enlarged, Replacement and Major Repair Measures –

Detailed construction plans shall be submitted to the City, including the following:

a. Plan and cross-section views of the existing and proposed shoreline configuration, showing accurate existing and proposed topography and OHWM.

b. Detailed construction sequence and specifications for all materials, including gravels, cobbles, boulders, logs, and vegetation. The sizing and placement of all materials shall be selected to accomplish the following objectives:

1) Protect the property and structures from erosion and other damage over the long term, and accommodate the normal amount of alteration from wind- and boat-driven waves;

2) Allow safe passage and migration of fish and wildlife; and

3) Minimize or eliminate juvenile salmon predator habitat.

c. For hard structural stabilization measures when shoreline vegetation is required as part of mitigation, a detailed 5-year vegetation maintenance and monitoring program to include the following:

1) Goals and objectives of the shoreline stabilization plan;

2) Success criteria by which the implemented plan will be assessed;

3) A 5-year maintenance and monitoring plan, consisting of one (1) site visit per year by a qualified professional, with annual progress reports submitted to the Planning Official and all other agencies with jurisdiction;

4) A contingency plan in case of failure; and

5) Proof of a written contract with a qualified professional who will perform the monitoring.

d. Fee for a consultant selected by the City to review the shoreline stabilization plan, the monitoring and maintenance program, the narrative justification of demonstrated need, and drawings. In addition, the Planning Official may require a fee for a consultant to review the geotechnical report and recommendations. In the case of use of a consultant, the applicant shall sign the City's standard 3-party contract.

9. Maintenance Agreement for Hard and Soft Structural Stabilization -

The applicant shall complete and submit a 5-year period maintenance agreement, using the City's standard form, for recording to ensure maintenance of any structural shoreline stabilization measure.

10. General Design Standards - The following design standards shall be incorporated into the stabilization design:

a. Soft structural shoreline stabilization measures shall be used to the maximum extent feasible, limiting hard structural shoreline stabilization measures to the portion or portions of the site where necessary to connect to existing hard shoreline stabilization measures on adjacent properties. The length of hard structural shoreline stabilization connections to adjacent properties shall be minimized to the maximum extent feasible, and extend into the subject property from adjacent properties no more than needed.

b. For enlarged, major repair or replacement of hard structural shoreline stabilization measures, excavation and fill activities associated with the structural stabilization shall be landward of the existing OHWM, except when not feasible due to existing site constraints or to mitigate impacts of hard structural stabilization by increasing shallow water habitat with gravel, rocks and logs.

c. For short-term construction activities, hard and soft structural stabilization measures must minimize and mitigate any adverse impacts to ecological functions by compliance with appropriate timing restrictions, use of best management practices to prevent water quality impacts related to upland or in-water work, and stabilization of exposed soils following construction.

d. For long-term impacts, new, enlarged or major repair or replacement of hard structural shoreline stabilization shall incorporate the following measures into the design wherever feasible.

1) Limiting the size of hard structural shoreline stabilization measures to the minimum necessary, including height, depth, and mass.

2) Shifting hard stabilization structure landward and/or sloping the structure landward to provide some dissipation of wave energy and increase the quality or quantity of nearshore shallow-water habitat.

e. For new and enlarged hard shoreline stabilization, the following additional measures shall be incorporated into the design:

1) To increase shallow-water habitat, install gravel/cobble beach fill waterward of the OHWM, grading slope to a maximum of 1 vertical (v): 4 horizontal (h). The material shall be sized and placed to remain stable and accommodate alteration from wind- and boat-driven waves.

2) Plant native riparian vegetation as follows:

a) At least 75 percent of the nearshore riparian area located along the edge of the OHWM shall be planted.

b) The vegetated portion of the nearshore riparian area shall average ten (10) feet in depth from the OHWM, but may be a minimum of 5 feet wide to allow for variation in landscape bed shape and plant placement provided that the total square footage of the area planted equals ten (10) feet along the water's edge.

c) Restoration of native vegetation shall consist of a mixture of trees, shrubs and groundcover and be designed to improve habitat functions. At least 3 trees per 100 linear feet of shoreline and 60% shrubs must be included in the plan.

d) Plant materials must be native and selected from the Kirkland Native Plant List, or other native or shoreline appropriate species approved by the Planning Official or Urban Forester.

e) An alternative planting plan or mitigation measure in lieu of meeting this section shall be allowed if approved by other state and federal agencies. In addition, the City shall accept existing native trees, shrubs and groundcover as meeting the requirements of this section, including vegetation previously installed as part of a prior development activity, provided that the existing vegetation provides a landscape strip at least as effective in protecting shoreline ecological functions as the required vegetation.

f) Standards for vegetation placement are provided in KZC 83.400.

f. Hard and soft shoreline stabilization measures shall be designed to not significantly interfere with normal surface and/or subsurface drainage into Lake Washington, constitute a hazard to navigation or extend waterward more than the minimum amount necessary to achieve effective stabilization.

g. Hard and soft stabilization measures are allowed to have gravel, logs and rocks waterward of the OHWM, as approved by the City and federal and state agencies, to provide enhancement of shoreline ecological functions through creation of nearshore shallow-water habitat.

h. Stairs or other water access measures may be incorporated into the shoreline stabilization, but shall not extend waterward of the shoreline stabilization measure.

i. The shoreline stabilization measures shall be designed to ensure that the measures do not restrict public access or make access unsafe to the shoreline, except where such access is modified under the provisions of KZC 83.420 for public access. Access measures shall not extend farther waterward than the face of the shoreline stabilization structure.

j. See KZC 83.300.11 and 12 below concerning additional design standards for hard structural stabilization and KZC 83.300.13 for soft structural stabilization.

11. Specific Design Standards for New or Enlarged Hard Structural Stabilization –

In addition to the general design standards in KZC 83.300.10 above, the following design standards shall be incorporated:

a. Where hard stabilization measures are not located on adjacent properties, the construction of a hard stabilization measure on the site shall tie in with the existing contours of the adjoining properties, as feasible, such that the proposed stabilization will not cause erosion of the adjoining properties.

b. Where hard stabilization measures are located on adjacent properties, the proposed hard stabilization measure may tie in flush with existing hard stabilization measures on adjoining properties, but by no more than as reasonably required. The new hard stabilization measure shall not extend waterward of OHWM, except as necessary to make the connection to the adjoining hard stabilization measures. No net intrusion into the lake and no net creation of upland shall occur with the connection to adjacent stabilization measures.

c. Fill behind hard shoreline stabilization measures shall be limited to an average of one (1) cubic yard per running foot of bulkhead. Any filling in excess of this amount shall be considered a regulated activity subject to the regulations in this Chapter pertaining to fill activities and the requirement for obtaining a shoreline substantial development permit.

12. Specific Design Standards for Replacement of Hard Structural Stabilization –

Replacement hard structural stabilization measures shall not encroach waterward of the OHWM or waterward of the existing shoreline stabilization measure unless the primary structure was

constructed prior to January 1, 1992 (RCW 90.58.100.6 and WAC 173.26.241 and WAC 173.26.231.3.j), and there is overriding safety or environmental concerns if the stabilization measure is moved landward of the OHWM. In such cases, the replacement structure shall abut the existing shoreline stabilization structure. All other replacement structures shall be located at or landward of the existing shoreline stabilization structure.

13. Specific Design Standards for Soft Structural Stabilization –

    In addition to the general design standards in KZC 83.300.10, the following design standards shall be incorporated:

    a. Provide sufficient protection of adjacent properties by tying in with the existing contours of the adjoining properties to prevent erosion at the property line. Proposals that include necessary use of hard structural stabilization measures only at the property lines to tie in with adjacent properties shall be permitted as soft structural shoreline stabilization measures. The length of hard structural stabilization connections to adjacent properties shall be the minimum needed and extend into the subject property from adjacent properties as reasonably required.

    b. Size and arrange any gravels, cobbles, logs, and boulders so that the improvement remains stable in the long-term and dissipate wave energy, without presenting extended linear faces to oncoming waves.

14. Expansion of SMA Jurisdiction from Shift in OHWM -

    If a shoreline stabilization measure from any action required by this Chapter or intended to improve ecological functions results in shifting the OHWM landward of the pre-modification location that expands the shoreline jurisdiction onto any property other than the subject property, then as part of the shoreline permit process found in KZC 141:

    a. The City shall notify the affected property owner in writing, and

    b. The City may propose to grant relief for the affected property owners from applicable shoreline regulations resulting in expansion of the shoreline jurisdiction. The proposal to grant relief must be submitted to the Department of Ecology with the shoreline permit under the procedures established in KZC 141.70.5. If approved, notice of the relief, in a form approved by the City Attorney, shall be recorded on the title of the affected property in the King County Office.

83.310 Breakwaters, Jetties, Groins

1. Breakwaters, jetties, and groins are not permitted in the Natural, Urban Conservancy, or Residential – L shoreline environments. Breakwaters, jetties, and groins may only be permitted in other shoreline environments where necessary to support water-dependent uses, public access, shoreline stabilization, or other specific public purpose.

2. The City will permit the construction and use of a breakwater, jetty or groin only if:

    a. The structure is essential to the safe operation of a moorage facility or the maintenance of other public water-dependent uses, such as swimming beaches;

    b. The City determines that the location, size, design, and accessory components of the moorage facility or other public water-dependent uses to be protected by the breakwater are distinctly desirable and within the public interest; and

    c. The benefits to the public provided by the moorage facility or other public water-dependent uses protected by the breakwater outweigh any undesirable effects or adverse impacts on the environment or nearby waterfront properties.

3. Design Standards

    a. All breakwaters, jetties or groins must be designed and constructed under the supervision of a civil engineer or similarly qualified professional. As part of the application, the engineer or other professional designing the breakwater, jetty or groin must certify that it is the smallest

commercial uses, structures, or pavement and Natural for all distance beyond the line of development.

Policies

SF-1 Provide a comprehensive shoreline environment designation system to categorize Redmond's shorelines into similar shoreline areas to guide the use and management of these areas.

Shoreline environments are designations applied to similar shoreline areas to guide the use and management of these areas. The following policies describe the purpose of each environment, the criteria used to designate the environment, and some management policies specific to the environment. Redmond has five different environments: Aquatic, Natural, Urban Conservancy, Shoreline Residential, and High-Intensity/Multi-Use.

SL-1 Aquatic Environment.

Purpose. The purpose of this designation is to protect, restore, and manage the unique characteristics of the aquatic environment by managing use activities and by assuring compatibility between upland and aquatic uses and ensuring that shoreline ecological functions are protected and restored over time. It is designed to promote the wise use of the natural features and resources of water areas that are substantially different in character from those of adjoining uplands. Allowed uses are those that require an open water location.

Designation Criteria. Aquatic areas apply to all lakes subject to this program waterward of the ordinary high water mark. This designation does not apply to rivers and creeks subject to this program.

Management Policies.

1. Provisions for aquatic environment shall be directed towards maintaining and restoring shoreline ecological functions.
2. Uses that cause significant ecological impacts to critical freshwater habitats shall not be allowed.
3. Uses and modifications shall be designated and managed to prevent degradation of water quality and alteration of natural hydrographic conditions.
4. Structures that are not water-dependent and uses that will substantially degrade the existing character of the area are prohibited.
5. New over-water structures for water-dependent uses or public access are allowed provided they will not preclude attainment of ecological restoration.

6. Limit the size of new over-water structures to the minimum necessary to support the structures intended use.
7. Multiple use over-water facilities are encouraged in order to reduce the impacts of shoreline development and increase effective use of water resources.
8. Developments within the aquatic environment shall be compatible with the adjoining upland environment.
9. Diverse public access opportunities to water bodies should be encouraged and developed and shall be compatible with the existing shorelines and water body uses and environment.
10. In appropriate areas, fishing and recreational uses of the water should be protected against competing uses that would interfere with these activities.
11. All developments and activities using navigable waters or their beds should be located and designed to minimize interference with surface navigation, to minimize adverse visual impacts, and to allow for the safe, unobstructed passage of fish and animals, particularly those whose life cycles are dependent on such migration.
12. Fills shall be prohibited except for shoreline restoration.
13. Underwater pipelines and cables shall not be allowed unless they are the best location due to the nature of the facility and the adverse environmental impacts are not significant or can be shown to be less than the impact of upland alternatives. When allowed, such facilities shall include adequate provisions to insure against substantial or irrevocable damage to the environment.

SL-2 Natural Environment.

Purpose. The natural environment shall preserve and restore those natural resource systems existing relatively free of human influence and those shoreline areas possessing natural characteristics intolerant of human use or unique historical, cultural, or educational features. These systems require severe restrictions on the intensities and types of uses permitted so as to maintain the integrity of the ecological functions and ecosystem-wide processes of the shoreline environment.

Designation Criteria. Areas to be designated Natural shall reflect one or more of the following criteria:

1. Wildlife habitats.
   a. A shoreline area that provides food, water, or cover and protection for any rare, endangered, or diminishing species, or

including the Federally listed Puget Sound Chinook, and anadromous and resident fish.

Bear Creek is one of the most important spawning and rearing habitats, particularly for Coho salmon, in the Lake Washington basin, and one of the most important salmon streams in King County. **For its size, Bear Creek is considered by the State to be *the* most important salmon-spawning stream in Washington.** Bear Creek supports Coho, Chinook and sockeye salmon, and steelhead trout. Resident fish in the creek consist of cutthroat trout, rainbow trout, and kokanee. The State considers all of Bear Creek a "critical spawning area" for these resident fish. All of the creek's salmon and steelhead stocks are considered wild (non-hatchery).

Despite certain areas of degraded habitat, salmon have been observed in both Evans Creek and its tributaries. A section of Evans Creek near 196th Avenue NE is a major spawning area for Coho, and is considered a Priority Habitat by the Washington State Department of Fish and Wildlife.

SF-2 Protect and restore the natural resources and ecological functions of the shoreline, including wildlife habitat, fisheries and other aquatic life, natural hydrologic processes, and shoreline vegetation consistent with the planned uses of the shorelines. Ensure no net loss of shoreline ecological functions.

SL-6 Protect habitats critical to the lifecycle of salmon and steelhead, such as migration, rearing, feeding and spawning areas.

SL-7 Prohibit re-alignment or channelization of streams, clearing of adjacent native vegetation or large woody debris, and water withdrawals and diversions in salmon and steelhead habitats, except for the purpose of habitat restoration and enhancement. Allow and encourage restoration that reconstructs a meandered channel or channel diversity.

SL-8 Locate over-water structures when allowed outside of salmon and steelhead spawning areas and design these structures to achieve no net loss of shoreline ecological functions. Use open piling structures that minimize disruption of spawning beds and underwater shading rather than floating structures, landfills or solid structures.

SL-9 Design and construct bulkheads or other shoreline protective structures on Lake Sammamish in the vicinity of sockeye salmon spawning beds to minimize erosion of the beach in front of the

bulkhead and to achieve no net loss of shoreline ecological functions. Encourage strongly the use of alternatives to bulkheads.

SL-10 Encourage joint use and shared use docks over single use docks to reduce adverse impacts on salmon and steelhead. Encourage alternatives to docks, such as floats or lifts.

SL-11 Design and construct new and replacement docks and piers on Lake Sammamish to minimize adverse impacts on salmon and steelhead and to achieve no net loss of shoreline ecological functions.

Habitat Restoration and Enhancement

The extent of natural fish and wildlife habitat in shoreline areas has been greatly reduced by inadequately planned development, as has the quality of remaining habitat areas. When the Sammamish River and lower Bear Creek were channelized, much of the habitat in the river and creek was lost. Aspects of fish and wildlife habitat that have been impacted by development include fragmented vegetation buffers, exotic and invasive species dominating buffers, lack of large trees and other habitat features, and water quality degradation due to high temperatures and sedimentation.

Public and private efforts are needed to restore habitat areas. Opportunities include public-private partnerships, partnerships with other agencies and tribes, capital improvement projects, and incentives for private development to restore and enhance fish and wildlife habitat.

SL-12 Identify the key role of the City's Shoreline Restoration Plan as improving shoreline ecological functions over time.

SL-13 Continue to acquire shoreline areas, particularly those areas with vulnerable or fragile natural features, for the purpose of protection, restoration and study.

SL-14 Include provisions for shoreline vegetation restoration, fish and wildlife habitat enhancement and, where feasible, retrofitting of existing capital improvements (e.g. outfalls) with habitat improvements in City capital improvement projects. Design these projects to achieve no net loss of shoreline ecological functions.

SL-15 Reintroduce, as opportunities become available, the natural channel characteristics of the Sammamish River by moving levee embankments away from the channel, removing barriers to connect streams and wetlands to the river, changing in-stream channel

SL-55 Permit landfills and excavations only in predominately upland areas outside of important habitat areas. Allow landfills and excavations in aquatic areas for the purpose of habitat enhancement. Limit all landfill and excavation activities, where allowed, to the minimum extent necessary to accommodate the proposed use, and prohibit long-term degradation of shoreline hydrology or water quality.

Marinas

Due to the nature of Redmond's shorelines, marinas in Redmond are located only on Lake Sammamish. The other shorelines are too small to accommodate them. Boat ramps and launching sites for small boats may be located on the Sammamish River or Lake Sammamish. Care is needed to locate these facilities in areas that will not affect the natural environment and nearby uses.

SL-56 Design and locate marinas, boat ramps and launching sites so as to not interfere with existing in-water recreational activities, significantly damage fish and wildlife habitats, and be aesthetically and functionally compatible with the shoreline area and nearby uses. Prohibit such facilities on Bear and Evans Creeks.

SL-57 Use, store, and dispose of fuels and waste materials associated with recreational boating in a manner which minimizes the potential for pollutants to enter the water.

Piers and Docks

Piers and docks can have significant impacts on the natural features and scenic values of the shoreline, navigation, water-dependent recreation and public access, native plant, fish, and wildlife habitat and water quality. However, residential piers and docks are long-established uses on Lake Sammamish, and a preferred shoreline use under the Shoreline Management Act, and as such, may continue to be utilized and located on the lake.

SL-58 Locate residential piers and docks so they do not interfere with public swimming beaches, public fishing areas, and boating corridors. Design and construct piers and docks to minimize impacts on native fish and wildlife and their habitat. Prohibit such facilities on Bear and Evans Creeks.

SL-59 Encourage sharing of new piers and docks within new developments. Encourage the consolidation and multiple use of residential docks.

SL-60 Locate floatplane facilities so they do not interfere with public swimming beaches, public fishing areas, and boating corridors. Limit these to facilities accessory to a residential use. Design and construct floatplane facilities to minimize impacts on native fish and wildlife and their habitat. Encourage minimization of their impact on shoreline views. Limit these facilities to parcels large enough to safely accommodate them. Protect adjacent development and uses as well as human safety from these facilities, including limiting noise and other impacts on residential uses.

Outdoor Signage

Outdoor signage refers to signs used to identify a business, and excludes directional, traffic, and interpretive signs, and other similar informational signs. Outdoor signs in the shoreline, if not carefully designed, located and illuminated, can degrade the aesthetic values of the shoreline, view corridors, and impact fish and wildlife.

SL-61 Design and locate outdoor signs in the shoreline jurisdiction to avoid intrusion into and minimize glare into fish and wildlife habitats, buffers, shoreline views and public access areas.

Outdoor Storage

Outdoor storage (i.e., storage not contained within a building) in the shoreline can introduce potentially harmful materials into the water, such as through spills or flooding. This can have serious effects on fish habitat, wildlife, and aquifers. The operation of outdoor storage areas can generate noise and dust impacts on the shoreline environment. Outdoor storage can also conflict with goals for protecting shoreline aesthetics, particularly if public trails or views are nearby.

SL-62 Design and locate outdoor storage incidental to other uses to avoid potential flood and water quality hazards, and screen them from public access areas and shoreline view corridors. Direct lighting of outdoor storage areas, where allowed, away from or screened from the shoreline. Prohibit outdoor storage as a primary use in the shoreline area.

Shoreline Recreation

Shoreline recreation is a preferred shoreline use under the Shoreline Management Act and Redmond's Shoreline Master Program. Shoreline recreation may be water-dependent, such as canoeing or swimming, water-related, such as bird watching, or a water-enjoyment use, such as

an interpretive center. These and other recreational uses can be well suited to shoreline areas if they are properly designed and maintained.

SL-63 Give preference to shoreline recreational development related to access to, enjoyment and use of the water and shorelines of the state.

SL-64 Design parks and other recreational developments to be compatible with adjacent preferred shoreline uses, and to protect fish and wildlife habitats. Encourage maintenance activities to protect water quality and minimize fish and wildlife and vegetation disturbance.

SL-65 Include both active and passive recreation areas, and facilities that are designed to encourage use of the shoreline by all members of the community, regardless of physical ability in Redmond's system of shoreline recreation.

Shoreline Protective Structures

Shoreline protective structures (e.g. bulkheads, rip rap, revetments) have major adverse impacts. Their impacts are especially significant along salmon spawning areas such as streams, rivers, and lakes used by Sockeye salmon, such as Lake Sammamish. On these areas, bulkheads and riprap can cover spawning beds. They increase water velocities, eroding spawning beds. They also remove vegetation that shades water and provides food for fish and wildlife. These facilitates can shift erosion downstream and increase downstream flooding impacts. Structural reinforcement of a shoreline or stream bank encourages reliance on "last resort" solutions, instead of promoting more effective methods such as setting back away from potentially eroding streams. Consequently, Shoreline Master Program policies discourage shoreline protective structures and encourage designs that avoid erosion hazards. However, limited bank reinforcement is allowed for habitat enhancement projects, public access, public roads, and protecting existing structures from floods. The Shoreline Management Act requires that shoreline master programs give preference to erosion protection measures for single-family residences occupied before January 1, 1992. Redmond's shoreline policies address the issue of protection for single-family homes while minimizing impacts to the natural environment.

SL-66 Encourage design and location of new shoreline development to avoid the need for shoreline modification or protective structures. Allow shoreline protective structures only as necessary for:

- *Supporting or protecting an allowed primary structure or a legally existing shoreline use that is in danger of loss or substantial damage;*

- *Reconfiguring the shoreline for mitigation or enhancement purposes; or*
- *Shoreline modifications that are appropriate to the specific type of shoreline and environment conditions for which they are proposed.*

SL-67 Design shoreline modification, where allowed, to minimize impacts on shoreline hydrology, navigation, habitat and public access. Design shoreline protective structures for the minimum height, bulk and extent necessary to address an identified hazard to an existing structure. Encourage use of vegetative and biotechnical solutions rather than structural bank reinforcement.

Transportation and Circulation

Transportation and circulation patterns to a great degree shape the location and character of shoreline land uses. Transportation facilities have the potential to diminish shoreline views, reduce public access and remove vegetation. For example, major roadway expansions can become significant barriers between upland residences and the shoreline. Large projects can bring undesirable impacts to residential neighborhoods. On Lake Sammamish, in particular, major roadways or bridges in the shoreline would severely degrade views and could introduce noise and air pollution at levels incompatible with residential uses. Parking facilities for shoreline development can cause spillover of excessive noise, glare and pollutants into fish and wildlife habitat areas. The design of shoreline transportation and circulation projects should address such impacts by avoiding locating in the shoreline. Alternatively, impacts should be mitigated. For example, pedestrian crossings should be provided where shoreline access is needed. Streets, bridges, bikeways and sidewalks should be designed to provide shoreline views and incorporate attractive gateway design elements and pedestrian amenities. Landscaping and re-establishment of large trees and shoreline vegetation should be included in mitigation plans. Well-designed circulation facilities promote public access and views of the shoreline. Good design can also reduce the presence of auto-oriented development in shoreline (along with associated impacts). Including pedestrian and bike facilities in transportation projects complements region-wide goals for enhancing non-motorized transportation.

SL-68 Encourage location of transportation facilities and parking facilities away from the water body, unless no feasible alternative exists. Discourage parking as a primary use along the shoreline.

SL-69 Design and landscape transportation and parking facilities within the shoreline jurisdiction to avoid or minimize impacts to existing

section, 20D.150.60-010 and other applicable portions of the Shoreline Master Program.

(5) In any High Intensity/Multi-Use location within a buffer where the land is actively being used as part of a legitimate business operation, such land including either structures or active operational areas, established prior to January 1, 2003, may continue to operate. New structures, pavement, and other improvements are permitted within this area so long as incremental environmental benefit is provided and no net loss of shoreline ecological functions id demonstrated.

20D.150.60-020 Lake Sammamish Setback.
Lake Sammamish has no buffer (as noted in 20D.150.60-010 above) but rather has a building setback. The waterfront-building setback for new development and redevelopment (tear downs) along Lake Sammamish shall be a minimum of 35 feet. The building setback can be reduced to 20 feet if the setback area is revegetated with primarily native vegetation. Establishment of a tree canopy is encouraged. No constructed structures other than those required for waterfront access/docks are allowed within the 20-foot setback. New development adhering to the 35-foot setback and/or reconstruction that involves greater than 50% the value of existing improvements shall be required to plant 50% of the area in the minimum 20 foot building setback with native vegetation.

20D.150.60-030 Buffer and Setback Measurements
Shoreline buffers and waterfront-building setbacks are measured from the ordinary high water mark.

20D.150.70 In-Water Structures

20D.150.70-010 Purpose.
The purpose of this chapter is to provide standards and guidelines for the location and design of docks, marinas, boat launches, and similar in-water structures that have the potential to adversely impact natural shoreline resources.

20D.150-70-020 Applicability.

(1) All in-water structures shall comply with the standards of this chapter.

(2) Critical Areas Restrictions. In-water structures are also subject to the requirements of RCDG 20D.140.30-030, Alteration of Wetlands, and RCDG 20D.140.20-040, Alteration of Riparian Stream Corridors.

20D.150.70-030 Permitted In-Water Structures.

(1) In-water structures shall be allowed for the following purposes only:
- (a) A water-dependent use; provided that proposals for new in-water structures demonstrate that the use cannot reasonably be accommodated by an existing in-water structure or mooring buoy;
- (b) Public access;
- (c) Enhancement of fish or wildlife habitat, or water-quality enhancement;
- (d) Construction of crossings for roads, regional light rail transit systems, bikeways or trails, provided the installation complies with the additional standards of RCDG 20D.140, Critical Areas. Note that bridge crossings are not permitted across Lake Sammamish.

(2) Restricted Locations. In-water structures shall be located away from critical habitat areas and public access facilities as follows:
- (a) In-water structures shall not be located in salmon and steelhead spawning areas or freshwater clam beds.
- (b) Marinas, boat ramps, float plane facilities and community boat docks shall be located a minimum of 100 feet from critical wildlife nesting areas, natural lake beaches, and Category I and II wetlands. Greater buffers may be required pursuant to RCDG 20D.140.20-050, Alteration of Fish and Wildlife Habitat Conservation Areas.
- (c) Marinas, motorized boat ramps, floatplane facilities, and private docks or piers shall be located a minimum of 100 feet from a public swimming beach.
- (d) Marinas and boat ramps are prohibited on Bear and Evans Creeks.
- (e) Floats are allowed on Lake Sammamish only.

(3) Floating homes are prohibited.

20D.150.70-040 General Design Requirements for In-Water Structures.

(1) Proposals for in-water structures shall provide a pre-construction habitat evaluation, including an evaluation of salmon and steelhead habitat, freshwater clam habitat, and critical wildlife habitat, and a post-construction monitoring plan. They shall also include an evaluation of shoreline ecological functions and demonstrate how the project achieves no net loss of shoreline ecological functions.

(2) Proposals for in-water structures shall mitigate adverse impacts to fisheries, aquatic and wildlife resources, shoreline and native aquatic vegetation, and impacts to other natural shoreline systems. Mitigation may include, but is not limited to, joint use of existing structures, open decking on piers, replacement of non-native vegetation, installation of in-water habitat features, or restoration of shallow water habitat. All proposals for in-water structures, except for single-family residential docks and piers,

shall, at a minimum, meet the requirements of RCDG 20D.140.20-060, Riparian Stream Corridor Performance Standards and RCDG 20D.140.30-040, Wetland Performance/Design Standards.

(3) Protection of Vegetation.
(a) In-water structures shall be designed and located to minimize shading of native aquatic vegetation. Removal of shoreline, riparian and aquatic vegetation shall be limited to the minimum extent necessary to construct the project. All upland and aquatic areas disturbed by construction shall be replanted with native vegetation.
(b) In-water structures shall include the installation of native aquatic plants, such as hardstem bulrush (*Scirpus acutus*), below the ordinary high water mark to a minimum width of 10' to mitigate the effects of introduced structures on wave action and erosion.
Significant trees shall be protected and replaced adjacent to the water body, pursuant to RCDG 20D.150.110, Tree Protection, Landscaping and Screening Within Shorelines.

(4) New or replacement in-water structures shall be designed and located such that natural hydraulic and geologic processes, such as erosion, wave action, or floods will not necessitate the following:
(a) Reinforcement of the shoreline or stream bank with new bulkheads or similar artificial structures to protect the in-water structure;
(b) Excessive dredging; or
(c) Dredging in salmon and steelhead spawning areas.
Replacement of in-water structures shall include proper removal of abandoned or other manmade structures and debris.

(5) All in-water structures shall be designed to allow for the free passage of water and fish.

(6) In-water structures are not subject to the waterfront setbacks or building setbacks otherwise provided for in the Community Development Guide. Specific types of in-water structures are subject to side property line setbacks as identified in the specific sections that follow.

(7) In-water structures shall not interfere with the public's right of navigation. Where in-water structures are located adjacent to public piers, public beaches, or other public open space, such structures shall provide or enhance public access commensurate with the scale of the project's impacts to public access.

(8) In-water structures shall be designed to minimize aesthetic impacts to the shoreline. In-water structures, excluding mechanical equipment associated with watercraft, shall consist of nonreflective or low-reflective material.

(9) Bulk storage of gasoline, oil and other petroleum products over the water or in the water is prohibited.

20D.150.70-050 Piers, Docks and Floats.
Piers and docks are prohibited in the Sammamish River, Bear Creek, and Evans Creek. Where new or replacement piers, docks, floats or boardwalks are allowed, they shall meet the following additional conditions:

(1) Demonstrated Need.
- (a) Where a proposed pier or dock is located within 100 feet of an existing pier or dock, the proposal shall demonstrate that a combined or shared facility is not available or feasible, or would not serve to reduce environmental impacts to shoreline resources. This shall not apply to piers and docks accessory to single family residences. Easements or covenants assuring joint use and specifying maintenance responsibility shall be provided with a joint application.
- (b) The proposal shall demonstrate that other means, such as floating moorage buoys or boat lifts, cannot accommodate the use or are not available or are infeasible.

(2) Number of Piers.
- (a) No lot shall have more than one pier, dock or float structure, except as provided below:
  - (i) An additional pier, dock or float structure is allowed where such structure is open to, and accessible to the public.
  - (ii) A residential lot may include one float in addition to one pier or one dock.
- (b) Finger piers supported by pilings are prohibited. Finger floats or docks are allowed.

(3) Each pier and float structure shall meet the length, width, height and area restrictions specified in this section.

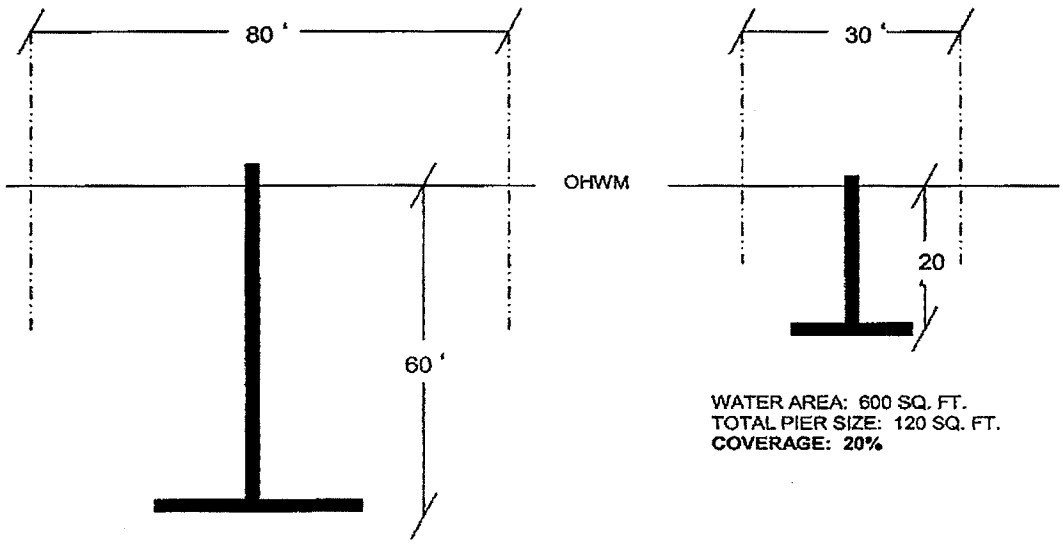
(4) Floats. Where allowed, residential floats or over-water platforms may not exceed 60 square feet in area, except that where a lot does not have a pier or dock, floats may not exceed 80 square feet. Floats and over-water platforms must be located no closer than five feet from a property line, and no further waterward than the waterward extent of the primary pier or dock, or than the point where the water depth reaches 13 feet, whichever is less.

(5) Maximum Coverage. The maximum total water coverage by piers, docks and floats per lot shall be as follows (see Figures 1 and 2):

(a) In single-family residential zones: The lesser of 20 percent of the area bounded by the line of ordinary high water, the waterward projection of the side property lines, and the waterward extremity of the pier projected parallel to the line of ordinary high water or 480 square feet. Small finger docks attached to the main pier and floats shall be included in this maximum area.

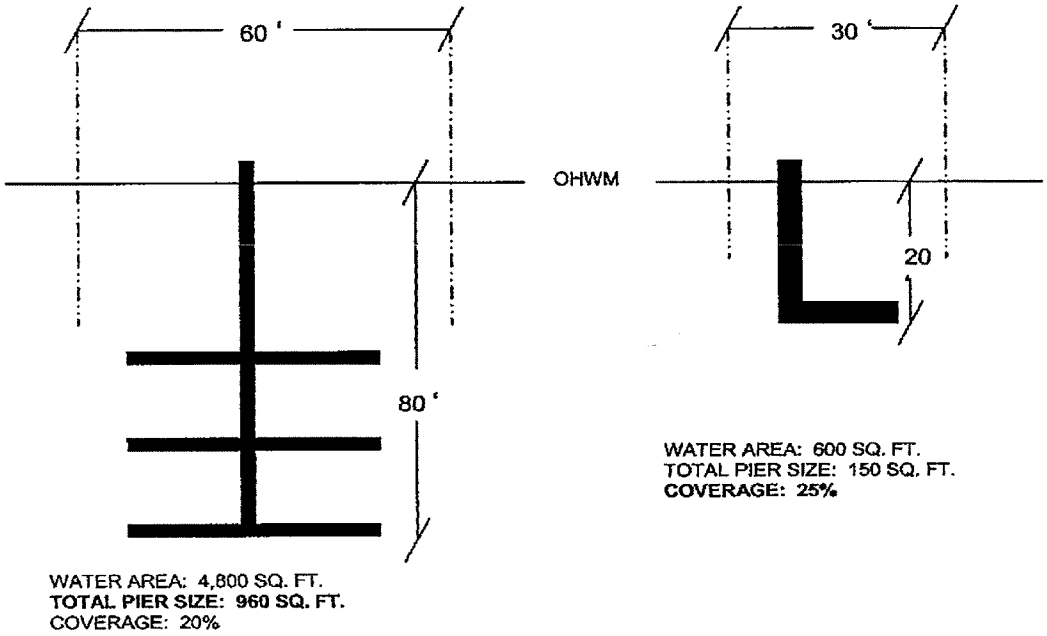
(b) In multiple-family residential zones: The lesser of 25 percent of the area bounded by the line of ordinary high water, the waterward projection of the side property lines, and the waterward extremity of the pier projected parallel to the line of ordinary high water or 960 square feet. Small finger docks attached to the main pier and floats shall be included in this maximum area.

Figure 1: Maximum Pier Coverage
Single Family Residential Zones



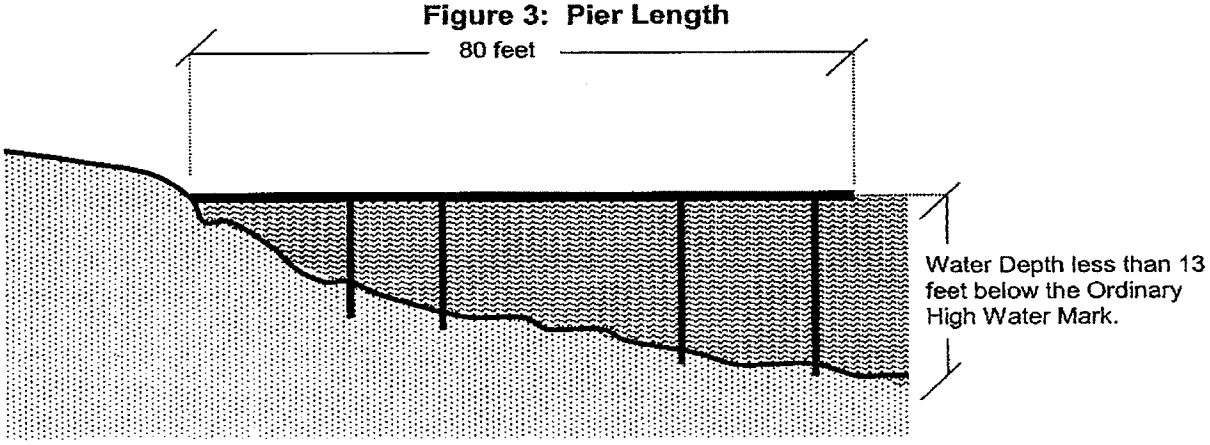
WATER AREA: 4,800 SQ. FT.
TOTAL PIER SIZE: 480 SQ. FT.
COVERAGE: 10%

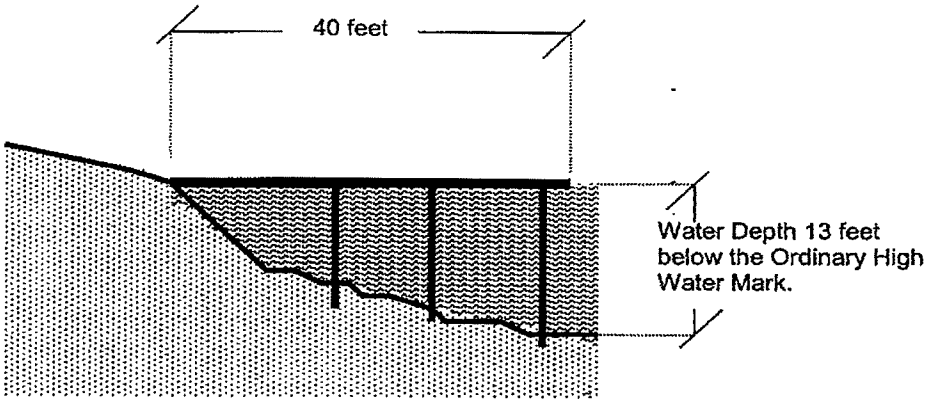
Figure 2: Maximum Pier Coverage
Multi-Family Residential Zones



(6) Pier Length. The maximum pier or dock length from the shoreline shall be the lesser of 80 feet, or a length necessary to reach a water depth at the end of the pier of 13 feet below ordinary high water (see Figure 3).

Figure 3: Pier Length





(7) Pier Width. No pier or dock may exceed six feet in width. Floats may not exceed ten feet in width.

(8) Pier Height.
- (a) No pier or dock shall exceed four feet in height above ordinary high water.
- (b) Railings, storage bins, signs, boat lifts and other features and structures accessory to piers, docks and floats shall have a height limit of four feet above the deck surface.
- (c) Public access features accessory to a public pier or dock, such as seating areas or interpretive signs, shall not project more than four feet above the deck surface of a pier or dock, except that covered public shelters shall not exceed 12 feet in height above the deck surface.
- (d) Skirting, decking lower than one vertical foot above ordinary high water, or similar structures around docks and floats are not allowed.

(9) Pier Separation and Setbacks. No pier or dock shall be located closer than 25' from another pier or dock or the maximum distance possible from any adjacent dock or pier, whichever is less. The minimum setback from any side property line is ten feet, except that shared facilities may be located adjacent to or on both sides of a property line upon agreement of the affected property owners.

(10) Any utility lines serving a pier or dock shall be located below the pier deck or underground.

(11) Lighting for piers and docks shall be the minimum necessary to locate the dock at night, shall be designed to minimize glare, and shall incorporate cut-off shields or otherwise shall be directed downward toward the dock.

Piers, docks and floats that are not lighted shall incorporate reflectors for nighttime visibility.

(12) Pilings and Decking. Piers, docks and pilings shall minimize shading of the water and habitat for salmonid predators by minimizing piling and decking area, as follows:
- (a) Piers shall use steel pin pilings where wave action and substrate allow. Piers using traditional pilings shall use the minimum number of pilings necessary to support the pier and maximize the distance between pilings.
- (b) The decking of all piers and docks shall be designed to allow 50% light passage. This may be accomplished through grated decks, light prisms, or other means.
- (c) Piers shall be designed to span, without pilings, aquatic areas where summer water depths range between 3.3 to 6.6 feet deep.
- (d) Pier platforms shall be designed and located to avoid or reduce shallow water (less than nine feet deep) shading.
- (e) Preferred construction techniques include vibratory pile drivers rather than conventional hammer pile drivers.

(13) Wooden components that will be in contact with standing water or floodwaters shall not contain creosote, pentachlorophenol, or similar toxic substances. Use durable, non-toxic materials for wooden components protection. Structures shall be made out of materials that have been approved by applicable state agencies.

(14) New residential development of two or more dwellings shall provide joint use or community dock facilities rather than individual docks for each residence, when feasible.

20D.150.70-060 Marinas and Boat Launches.

(1) Marinas in Publicly Owned Facilities. Marinas, boat ramps and boat launch sites located in publicly owned facilities such as parks must be available to the general public with no preference for private clubs or groups.

(2) All proposals for marinas and boat launching facilities that may require periodic removal of aquatic vegetation shall provide a comprehensive aquatic vegetation management and monitoring plan.

(3) Marinas and boat launching facilities shall be located no closer than 50 feet from another marina, boat launch, or dock.

(4) Marinas, boat ramps and launching sites shall be designed and located according to the following criteria:

(2) Boathouses and similar water-oriented structures may extend no further waterward than the ordinary high water line. Such structures shall meet the minimum side yard setback required in the underlying zone, unless they are a joint use facility that serves more than one adjoining waterfront lot.

(3) Water-oriented accessory structures shall not exceed ten feet in height and 250 square feet in area. However, multiuse structures that include storage and changing rooms may be a maximum of 500 square feet. The area of such covered structures shall be included in the maximum lot coverage and impervious surface limits of the zone in which they are located.

(4) Uncovered boat lifts and similar equipment or structures used for watercraft may be located waterward of the ordinary high water mark to the waterward limit of the associated pier or dock. Such structures associated with docks shall have a height limit of four feet above ordinary high water. Such structures associated with piers shall have a height limit of four feet above the deck of the pier. Where a boatlift is used in lieu of a pier, it may extend waterward of the ordinary high water mark, provided it does not exceed four feet above the OHWM in height and meets the side yard setback of the underlying zoning district. Covered boat lifts shall not exceed 96 inches in height as measured from the ordinary high water mark.

(5) Joint Use Accessory Structures. Water-oriented accessory structures that serve more than one adjoining waterfront lot may be constructed with a zero side setback from the common boundary, provided that the owners of such property enter into a reciprocal use agreement recorded with the King County Auditor.

20D.150.80 Shoreline Protective Structures

20D.150.80-010 Purpose.

The purpose of this chapter is to provide standards and guidelines for the location and design of bulkheads, levees and other shoreline protective structures that have the potential to adversely impact the shoreline natural environment. New development, however, should be located and designed to avoid the need for future shoreline stabilization to the extent feasible.

20D.150.80-020 Permitted Shoreline Protective Structures.

(1) New and replacement shoreline protective structures shall be allowed under the following circumstances only:

(a) A geotechnical analysis prepared by a licensed professional engineer demonstrates that shoreline stabilization is necessary to prevent damage to or loss of the following facilities, due to wave action, and no practicable alternative exists. The geotechnical analysis shall evaluate on-site drainage problems away from the shoreline edge before considering structural shoreline stabilization.
  (i) Existing structures, where the structure is a single-family residence or where the fair market value of the structure to be protected equals or exceeds the construction cost of the shoreline protective structure;
  (ii) Existing private roads and bridges;
  (iii) Public roads and bridges, and regional light rail transit facilities; or
  (iv) Public Shoreline access facilities.

(b) Shoreline structures are necessary to protect or enhance water quality or aquatic habitat; or

(c) Shoreline structures are necessary to remedy an emergency situation; and

(d) Shoreline structures, except temporary emergency construction, comply with the requirements of 20D.150.80-020(2) through (3), and 20D.150.80-030, Design Requirements for Shoreline Protective Structures.

(e) Erosion is not being caused by upland conditions, such as the loss of vegetation and drainage.

(f) Nonstructural measures, planting vegetation, or installing on-site drainage improvements are not feasible or not sufficient.

(2) Shoreline protective structures, including replacement structures, shall not be located in salmon and steelhead spawning areas or freshwater clam beds, except under the following circumstances:
  (a) A hydraulic analysis demonstrates that the protective structure will have no adverse impacts on long-term stream or lake hydraulics affecting salmon and steelhead spawning areas or freshwater clam beds;
  (b) A biological inventory and analysis demonstrates that impacts to salmonids and freshwater clams are negligible; and
  (c) For non-structural solutions, the proposed measures are necessary to protect or rehabilitate eroding shorelines, and are designed to protect or restore water quality and aquatic habitat.

(3) Shoreline protective structures shall not be allowed where they will result in any of the following:
  (a) Increased or expanded residential development in undeveloped areas of the floodplain or upland of ecologically intact shorelines;
  (b) Creation of dry land waterward of the ordinary high water mark of a lake, stream or wetland;

(c) Loss of significant flood storage capacity in the floodplain; or
(d) Deflection or constriction of flood flows to a degree which will result in significantly increased flood heights on unprotected properties.
(e) Loss of shoreline ecological functions.

(4) An existing shoreline stabilization structure may be replaced with a similar structure if there is a demonstrated need to protect principal uses or structures from erosion caused by currents or waves, provided the following is met:
(a) The replacement structure shall be designed, located, sized, and constructed to assure no net loss of ecological functions;
(b) Replacement walls or bulkheads shall not encroach waterward of the OHWM or existing structure unless the residence was occupied prior to January 1, 1992 and there are overriding safety or environmental concerns. In such cases, the replacement structure shall abut the existing shoreline stabilization structure.
(c) Soft shoreline stabilization measures that provide restoration of shoreline ecological functions may be permitted waterward of the OHWM.
(d) For the purposes of this section standards on shoreline stabilization measures ,"replacement" means the construction of a new structure to perform a shoreline stabilization function of an existing structure which can no longer adequately serve the purpose. Additions to or increases in size of existing shoreline stabilization measures shall be considered new structures.

(5) Breakwaters and jetties are prohibited.

20D.150.80-030 Design Requirements for Shoreline Protective Structures.

(1) All proposals for new and replacement shoreline protective structures, except those necessary to remedy an emergency situation, shall include all of the following:
(a) An evaluation by a licensed professional engineer or qualified geologist who has professional expertise about the region and local shoreline geology and processes of the hazard to be addressed, the need for the shoreline protective structure by estimating time frames and rates of erosion, and the feasibility of non-structural alternatives, such as the relocation of structures or biotechnical solutions, to address the particular hazard.
(b) A hydraulic analysis prepared by a licensed professional engineer that sufficiently describes the proposal's effects on stream or lake hydraulics, including potential increases in base flood elevation, changes in stream or wave velocity, changes in groundwater movement, the potential for redirection of the normal flow or

currents of the stream or lake, and potential for resultant erosion at other properties adjacent to the stream or lake.

(c) A biological inventory and analysis prepared by a professional biologist that sufficiently describes the proposal's effects on fisheries, aquatic life and wildlife. This shall include an evaluation of shoreline ecological functions that describe how the project will achieve no net loss of shoreline ecological functions.

(d) Where mitigation is required, a monitoring program pursuant to RCDG 20D.140.10-150, Monitoring Program and Contingency Plan.

(2) Structural solutions to stabilize or reinforce shorelines shall not be allowed, unless it is demonstrated that planting of vegetation, biotechnical measures, relocation or re-design of affected structures, or other non-structural solutions are infeasible or ineffective in preventing or correcting significant erosion. This shall apply to new, replacement, repair and emergency protective structures. Replacement or repair of bulkheads shall not be allowed except where it can be demonstrated that replacement with a non-structural solution is ineffective or infeasible. In general, hard armoring solutions are not permitted unless a geotechnical report pursuant to this section confirms that there is a significant possibility that such a structure will be damaged within three years as a result of shoreline erosion in the absence of such hard armoring measures, or where waiting until the need is that immediate, would foreclose the opportunity to use measures that avoid impacts of ecological functions.

(3) Structures shall have no long-term detrimental effects on stream or lake hydraulics, including increased wave energy or erosion at other properties, or on fisheries, aquatic life and wildlife.

(4) Shoreline protective structures shall be designed to the minimum size, height, bulk and extent necessary to remedy the identified hazard. Flood control dikes and levees shall be limited to the minimum height required to protect existing development in the floodplain from the design flood, as identified in the King County Flood Hazard Reduction Plan.

(5) Methods selected for shoreline protection shall be appropriate for the length and configuration of the existing shoreline, erosional conditions at the site, the natural condition and habitat functions of the shoreline, and adjacent land uses, particularly single-family residences and public access.

(6) Where structural solutions to shoreline protection are allowed, structures shall meet the following standards:

(a) Structures shall be located landward of the ordinary high water mark, except as provided below:

(i) Where a bulkhead exists, the toe of a replacement bulkhead shall not be located waterward of the toe of the existing bulkhead.

(ii) To the extent necessary to protect the toe of a slope with a gradient of 40% or greater, a bulkhead may extend waterward of the ordinary high water mark up to a maximum of six feet beyond the ordinary high water mark.

(iii) Flood control structures may extend waterward of the ordinary high water mark, but shall be located landward of the floodway and any wetlands associated with Class I streams or Lake Sammamish.

(b) Filling behind bulkheads shall be the minimum amount and extent necessary to install the protective structure. Fill material must be nondissolving and nondecomposing, and shall be free of materials that would be detrimental to water quality. The elevation of the existing shoreline in the vicinity of the protective structure shall not be raised more than four feet, except where necessary for an approved flood control structure such as a levee or dike.

(c) The existing contour of the natural shoreline shall be generally followed. Levees and dikes shall, where adjacent lands are within the same ownership or undeveloped, be set back from the ordinary high water mark to maintain natural bank gradients.

(d) Vertical wall or solid slab bulkheads shall not be allowed, unless it is demonstrated that riprap bulkheading or an open structure is infeasible and ineffective. This shall apply to new, replacement, repaired and emergency protective structures. Structures shall be designed with a tiered or sloping face, or similar design measure to minimize the impact of wave action.

(e) Riprap faces shall be constructed to a stable slope and shall be of a material of sufficient size to be stable. All riprap areas shall be inter-planted with native shrubs and groundcover of native species or erosion-control grasses.

(f) Rock used for shoreline protective structures shall be composed of clean, angular material of a sufficient size to prevent its being washed away. Rock used for toe protection shall be smooth, well-rounded gravel material suitable for use by spawning salmon and steelhead.

(g) Structures shall incorporate the installation of native aquatic plants, such as hardstem bullrush (Scirpus acutus), below the ordinary high water mark to mitigate the effects of introduced structures on wave action and erosion.

(7) Shoreline protective structures within shorelines and other water bodies used by or that have the potential to be used by salmonids shall provide for adequate upstream and downstream salmonid migration.

(8) Shoreline protective structures shall not interfere with the public's right of navigation. Where shoreline protective structures located on the Sammamish River or Lake Sammamish are wholly or partially publicly funded, such structures shall provide public access if none exists, or enhance existing public access, commensurate with the scale of the project's impacts to public access.

(9) Shoreline protective structures shall be designed to minimize aesthetic impacts to the shoreline.

(10) Protection of Vegetation. Removal of shoreline, riparian and aquatic vegetation shall be limited to the minimum extent necessary to construct the project. Significant trees and other shoreline or riparian vegetation shall be protected and replaced adjacent to the water body, pursuant to RCDG 20D.150.110, Tree Protection, Landscaping and Screening Within Shorelines. All upland and aquatic areas disturbed by construction shall be replanted and restored pursuant to RCDG 20D.140.30-040 Wetlands Performance/Design Standards and 20D.140.20-060, Riparian Stream Corridor Performance Standards.

(11) Proposals for bioengineered or other non-structural methods involving erosion-control plantings shall include a five-year maintenance plan to ensure the long-term survival of vegetation.

(12) All proposals for shoreline protective structures shall mitigate adverse impacts to fisheries, aquatic and wildlife resources, shoreline vegetation, and impacts to other natural shoreline systems. Mitigation may include, but is not limited to, relocation of threatened structures, use of natural vegetation for bank stabilization, replacement of native vegetation, installation of in-water habitat features, replacement of gravel substrate, or restoration of shallow water habitat. At a minimum, mitigation shall meet the requirements of RCDG 20D.140.30-040, Wetlands Performance/Design Standards and 20D.140.20-060, Riparian Stream Corridor Performance Standards.

(13) All proposals for shoreline protective structures shall include provisions for adequate erosion control, emergency erosion control, and protection of water quality, fisheries and aquatic life during construction.

(14) All material resulting from excavation or dredging during construction shall be disposed of in a manner that prevents the material entering into a water body through erosion or floodwaters.

(15) Maintenance corridors and service roads accessory to a shoreline protective structure shall be the minimum size necessary to safely

accomplish maintenance and repair; and shall be located, where possible, in areas already disturbed or away from significant trees, and where siltation and erosion impacts will be minimal.

20D.150.90 Clearing, Grading, Landfilling and Excavation Within Shorelines.

Clearing, grading, landfilling and excavation within the shoreline jurisdiction shall also meet all clearing and grading regulations specified in RMC Chapter 15.24, Clearing, Grading, and Stormwater.

20D.150.90-010 Prohibited Clearing and Grading.
The following clearing and grading activities are prohibited within the shoreline jurisdiction:

(1) Clearing or grading within shoreline buffers, except as part of a buffer restoration or mitigation plan and except as otherwise permitted under 20D.150.60-010(2) through (5).

(2) Clearing or grading within Lake Sammamish waterfront building setbacks, except for the purpose of habitat restoration and enhancement or natural beach enhancement or protection, or the installation of residential docks, shoreline protective structures, or public access, where allowed.

20D.150.90-020 Prohibited Landfilling.
The following landfilling activities are prohibited within the shoreline jurisdiction:

(1) Landfilling that will cause a significant change in the shoreline, or cause a significant reduction of the normal surface area of a body of water at ordinary high water; and

(2) Landfilling within salmon and steelhead spawning areas, or where the drift of fill materials is likely to adversely affect spawning areas.

20D.150.90-030 Permitted Landfilling and Excavation.
Landfilling and excavation under the following circumstances may be permitted:

(1) In the High Intensity/Multi-Use and Shoreline Residential shoreline environments.

(2) In the Aquatic, Natural, and Urban Conservancy shoreline environments, for the following uses only:
   (a) Enhancement or restoration of fish or wildlife habitat;
   (b) Shoreline protective structures;
   (c) In conjunction with boat launches, residential docks and public access facilities;

(a) New shoreline uses and developments are encouraged to be located, constructed, operated, and maintained to prevent water quality and storm water quantity impacts that would adversely affect shoreline ecological functions, or cause significant impact to shoreline aesthetics or recreational opportunities.

(b) New shoreline uses and developments should incorporate strategies to control phosphorus loading of lakes over the long term.

(c) New shoreline uses and developments should be designed and operated to minimize the need for chemical fertilizers, pesticides or other chemical treatments to prevent contamination of surface and ground water and/or soils and minimize adverse effects on shoreline ecological functions.

(d) New shoreline uses and developments are encouraged to minimize impervious surface and incorporate low impact development stormwater management techniques where reasonable to minimize surface water runoff and prevent water quality degradation.

(e) Point and non-point source pollution should be managed on a comprehensive, basin-wide basis to protect water quality and support the efforts of shoreline property owners to maintain shoreline ecological functions.

25.04.020 *Shoreline Modification Policies*

(1) **Boat Launch Ramps and Rails Policies**

(a) The City should assess regional needs for public boat launches so they can be co-located with other compatible water-dependent uses. The City should review proposals for new motorized boat launch facilities with regional recreation providers, including the Washington State Parks Department, adjacent cities, and King County, to avoid duplication and to minimize adverse impacts to shoreline ecological functions and processes. This policy is not intended to limit new locations for the public to launch human powered watercrafts (such as kayaks and canoes) as long as the developments do not result in the construction of additional launches as defined in SMC 25.02.010(13).

(b) New or expanded public launch ramps and rails should only be sited where they have no negative impact on critical areas or habitat with which priority species have a primary association.

(c) New private boat launch ramps and rails should be discouraged.

(2) **Docks, Floats, Mooring Buoys and Boat/Watercraft Lift Policies**

(a) New public and private docks, floats, mooring buoys and lifts should be designed and constructed with appropriate mitigation as required by this Program to ensure no net loss of ecological functions.

(b) New private docks, floats, and lifts should not be placed in locations where they will impact critical habitats where alternative locations are available.

(c) New shared or joint-use docks are preferred over single-user docks.

(d) The type, design, and location of docks, floats, mooring buoys and lifts should be consistent with applicable state and federal regulations and compatible with the area in which they are located. The City should consider shoreline characteristics, shoreline functions and processes, wind and wave action, water depth, aesthetics, and adjacent land and water uses when assessing compatibility.

(3) **Dredging Policies**

(a) Dredging should only be allowed in the following circumstances:

i. When needed to facilitate ecological restoration or enhancement;

ii. When needed to construct facilities for public access or water-oriented public recreation.

(b) New development should be sited and designed to avoid the need for maintenance dredging.

(c) When allowed, dredging should be planned and operated to minimize adverse impacts to shoreline ecology, to existing shoreline uses, and to minimize interference with navigation.

(d) Dredging for the primary purpose of obtaining fill material to create uplands is not allowed.

(4) **Filling and Excavation Policies**

(a) Fill and excavation should be allowed only in association with a permitted use/development and where allowed should be the minimum necessary to accommodate the proposed use.

(b) Filling and excavation should not be allowed where structural shoreline stabilization would be needed to prevent the fill from eroding.

(c) The perimeter of fill and excavation activities should be designed to avoid or eliminate erosion and sedimentation impacts, both during initial fill and excavation activities and over time.

(d) When allowed, filling and excavation should be conducted so that water quality, habitat, hydrology, and drainage patterns are not adversely affected.

(e) Excavation waterward of OHWM shall be considered dredging and shall be subject to the dredging policies and regulations of this Program.

(5) **Shoreline Stabilization Policies**

(a) New developments should be designed and located to avoid the need for new stabilization measures.

(b) Bulkheads and other forms of hard structural shoreline stabilization should be discouraged. Bulkhead alternatives that implement bioengineering and bio-stabilization methods should be used where reasonable.

(c) Shoreline stabilization including bulkheads and bulkhead alternatives should be located, designed, and maintained to minimize adverse effects on shoreline ecology, including effects on the project site and adjacent properties over time. Probable effects of proposed shoreline stabilization on ongoing shoreline processes and functions should be fully evaluated for consistency with this Program.

(d) Shoreline stabilization should be located and designed to fit the physical character of a specific shoreline reach, which may differ substantially from adjacent reaches.

(e) Shoreline stabilization should not interfere with existing or future public access to public shorelines or with other appropriate shoreline uses.

(f) Shoreline stabilization projects on public lands should be designed to accommodate multiple use, restoration, and/or public access, provided that safety and ecological protection are fully addressed.

(g) Failing, harmful, unnecessary, or ineffective shoreline stabilization structures should be removed, and shoreline ecological functions should be restored using bulkhead alternatives.

(h) The City should facilitate voluntary enhancement and restoration projects that replace hard structural shoreline stabilization with bulkhead alternatives and bio-engineered approaches. The City should provide technical assistance, education, and regulatory incentives for hard structural shoreline stabilization removal and restoration.

(i) Where existing legally established bulkheads are substantially repaired or replaced, property owners should make reasonable efforts to incorporate bioengineering and fisheries habitat enhancement design elements to minimize adverse effects on shoreline functions.

25.04.030 *Residential Use Policies*

(1) Single-family residences and their normal appurtenant structures are a preferred shoreline use. New residential development in the shoreline jurisdiction should be located and designed to minimize adverse effects on shoreline process and functions. Residential development should not be allowed to result in a net loss of shoreline ecological functions.

(2) New structures for uses accessory to residential development should minimize impervious surface and vegetation clearing, be visually and physically compatible with adjacent shoreline features, and be reasonable in size and purpose.

25.07.040 *Boat Launches - Ramps and Rails Regulations*

(1) Existing legally established launch ramps and rails associated with private residential development may be maintained and repaired.

(2) Public launch ramps and rails associated with public recreational uses shall be allowed on public land along the Lake Sammamish, Pine Lake, and Beaver Lake shorelines.

(3) New launch ramps and rails shall be designed as follows:

(a) New launch ramps or rails shall be anchored to the ground through the use of tie-type construction. New ramps that solidly cover the water body bottom are prohibited; and

(b) No portion of a launch ramp or rail shall be placed or extend more than sixty (60) feet waterward of the OHWM; and

(c) A launch ramp or rail shall be not be placed or extend to a depth greater than eight feet below the OHWM.

(4) New launch ramps and rails associated with private residential development are prohibited.

25.07.050 *Private Docks, Floats, Mooring Buoys and Watercraft Lift Regulations*

(1) **All Lakes**. The following regulations shall apply to private docks, floats, mooring buoys and lifts:

(a) No new dock or float shall be wider than fifty percent (50%) of the lot width at the waterfront edge.

(b) No new dock, lift (Lake Sammamish only), mooring buoy, or float shall be located closer than fifteen (15) feet from the side property line extended, except that joint-use docks, lifts and floats may abut or cross property lines for the common use of adjacent property owners when mutually agreed to by the property owners in an agreement recorded with King County.

(c) Mooring buoys shall be limited to the number allowed pursuant to Washington State Department of Natural Resources requirements.

(d) No new float shall cover more than one hundred fifty (150) square feet of the lake.

(e) No dwelling unit or building may be constructed on a dock, float or other moorage structure.

(f) The use of fill to construct new docks, floats, and/or lifts (lifts allowed on Lake Sammamish only) shall only be allowed pursuant to the requirements of SMC 25.07.030.

(g) New private docks, floats and/or lifts (lifts allowed on Lake Sammamish only) shall be designed and constructed using WDFW-approved methods and materials.

(h) The top surface of new private docks shall not exceed five (5) feet in height above the OHWM.

(i) Existing legally established private docks and floats may be repaired and maintained.

(2) **Lake Sammamish**. The following requirements apply to all new private docks, floats, and lifts on Lake Sammamish, including shared/joint-use facilities and beach club facilities.

(a) Each individual residential lot on Lake Sammamish shall be allowed: one (1) residential dock, one (1) float, two (2) boat lifts, and two (2) personal watercraft lifts. In lieu of the two (2) boat lifts and two (2) personal watercraft lifts, four (4) personal watercraft lifts may be permitted.

(b) Contiguous lots using shared/joint-use docks shall be allowed one (1) additional boat lift and one (1) additional personal watercraft lift or two (2) additional personal watercraft lifts in addition to the allowances noted above for an individual lot.

(c) Lots that provide shared/joint-use for more than nine (9) residential homes shall be allowed one (1) additional dock for service of existing legally established launch ramps and rails, provided that the total area of overwater coverage does not exceed the maximum overwater area coverage allowed by this section.

(d) Maximum overwater area coverage for private docks on Lake Sammamish, excluding canopy coverage:

i. Six hundred (600) square feet for private residential docks serving one lot; or

ii. Eight hundred (800) square feet for private residential docks serving two (2) to nine (9) lots in a shared use agreement; or

iii. One thousand (1,000) square feet for private residential docks serving more than nine (9) lots in a joint-use agreement.

(e) No boat lift shall be located closer than five (5) feet from the side property line extended. New boat lifts installed between five (5) and fifteen (15) feet of the side property line extended must be installed perpendicular to the shoreline.

(f) Maximum length of private docks. The maximum waterward extent of any new dock or other in-water/overwater moorage structure shall be no longer than eighty (80) feet or the length needed to reach a depth of eight (8) feet (measured from ordinary high water), whichever is greater. No dock shall be more than one quarter (¼) the distance to the opposite shoreline.

(g) One boat canopy per residential lot is allowed provided that the canopy is made of translucent material. Canopies may be a maximum of twenty-five (25) feet in length, fifteen (15) feet in width, and ten (10) feet at the highest point over ordinary high water.

(3) **Pine Lake and Beaver Lake**. The following requirements apply to all new private docks and floats on Pine Lake and Beaver Lake, including shared/joint-use facilities and beach club facilities.

(a) Each individual residential lot on Pine and Beaver Lake shall be allowed: one (1) residential dock, and one (1) float.

(b) Maximum overwater coverage area for private docks on Pine and Beaver Lake:

i. Six hundred (600) square feet for private residential docks serving one lot.

ii. Seven hundred (700) square feet for private residential docks serving two (2) or more lots in a joint-use agreement.

(c) New boat lifts and canopies are not permitted on Pine and Beaver Lakes. Existing lifts and canopies may be maintained.

(d) The maximum waterward extent of any new dock or other in-water/overwater moorage structure shall be no longer than eighty (80) feet or the length needed to reach a depth of eight (8) feet (measured from ordinary high water), whichever is greater. No dock shall be more than one quarter (¼) the distance to the opposite shoreline.

25.07.060 *Public Docks and Floats Regulations*

(1) New public recreational docks and floats on public lands shall comply with the following:

(a) Public recreational docks shall be designed and constructed using WDFW-approved methods and materials; and

(b) No public recreational dock shall exceed 3,000 square feet in surface area. There is no dock length limit for public recreational docks.

25.07.070 *Shoreline Stabilization Regulations*

This section describes the types of shoreline stabilization permitted on all shorelines in Sammamish.

(1) When allowed pursuant to this Program, shoreline stabilization and permitted alternatives, including new, expanded, or replacement bulkhead alternatives and bulkheads, must meet all of the following requirements:

(a) The impacts must be mitigated such that there is no net loss of shoreline ecological functions. This is achieved by maintaining the required vegetation enhancement area in a vegetated condition, or planting the shoreline vegetation enhancement area in accordance with this Program; and

(b) The size of shoreline stabilization structure shall be limited to the minimum necessary to protect the primary structure; and

(c) The shoreline stabilization is designed by a state licensed professional geotechnical engineer and/or engineering geologist and constructed according to applicable state and federal laws; and

(d) The shoreline stabilization is designed and constructed to incorporate natural vegetation and habitat elements wherever reasonable, and constructed and maintained in a manner that does not degrade the water quality of affected waters; and

(e) No gabions, motor vehicles, appliances, structure demolition debris, or solid waste of any kind shall be used for shoreline stabilization. Any such objects that may be remnant from replaced shoreline stabilization must be removed from the shoreline and shoreline setback unless doing so would cause damage to the environment; and

(f) The shoreline stabilization shall be designed and constructed with gravel backfill and weep holes so that natural downward movement of surface or ground water may continue without ponding or saturation; and

(g) The shoreline stabilization on shores exposed to significant wave action shall be designed to dissipate wave energy and scouring; and

(h) Shoreline stabilization shall be placed landward of associated wetlands and buffers.

(2) Bulkhead alternatives and bioengineered shoreline stabilization (also known as bio-stabilization) are the preferred method for stabilizing shorelines and shall be permitted with proof of demonstrated need provided in a technical report prepared by a Washington State licensed engineer and/or a qualified biologist as appropriate. Such alternatives include large rocks, logs, revetments and other natural materials integrated with native vegetation to prevent erosion of land into the lakes.

(3) New or expanded hard structural stabilization may be permitted only when bulkhead alternatives are determined to be infeasible or insufficient and when required:

(a) To protect an existing primary residential structure from shoreline erosion caused by currents or waves (and not caused by normal sloughing, vegetation removal, or poor drainage) when there is a significant possibility that the primary structure will be damaged within three (3) years as a result of shoreline erosion in the absence of armoring measures.

(b) For projects whose primary purpose is remediating hazardous substances pursuant to RCW 70.105.

(c) For stabilization on public land to facilitate public shoreline access for substantial numbers of people.

(4) To comply with regulation SMC 25.07.070 (3) of this section, the property owner shall provide technical reports that:

(a) Evaluate the need for structural shoreline stabilization; and

(b) Describe alternatives to structural approaches and analyze the environmental effects of each alternative. Geotechnical analysis shall address the necessity of bulkheads or other armoring by estimating time frames and rates of erosion and report on the urgency associated with the specific situation. The geotechnical reports and alternatives analysis shall be prepared by a Washington State licensed engineer, engineering geologist and/or a qualified biologist as appropriate. The reports shall meet the application requirements of SMC 20.05 (Procedures for Land Use Permit Applications, Public Notice, Hearings and Appeals) and the critical areas study requirements of SMC 21A.50.130.

(5) Stairs may be built into shoreline stabilization but shall not extend waterward of OHWM. Stairs on the water-ward side of existing bulkheads may be maintained and repaired in-kind.

(6) When there is a need for an existing legally established bulkhead to be replaced, it may be done with bulkhead alternatives or bio stabilization. An existing bulkhead or similar stabilization structure may only be replaced with a structure of similar dimension and location when bulkhead alternatives are demonstrated to be infeasible or inadequate to protect the primary residential structure and the following criteria are met:

(a) There is a demonstrated need to protect the primary residential structure from erosion caused by currents or waves and not caused by normal sloughing, vegetation removal, or poor drainage; and

(b) The replacement structure shall not encroach waterward of the OHWM or the existing stabilization structure unless the primary use being protected is a residence that was occupied prior to January 1, 1992, and there are overriding safety or environmental concerns. In such cases, the replacement structure shall abut the landward side of the existing shoreline stabilization structure.

(7) Existing shoreline stabilization structures that are being replaced shall be removed unless removing the structure will cause more environmental harm than leaving it in place.

(8) An existing legally established bulkhead or similar hard shoreline stabilization structure may be repaired and maintained. If the repair or maintenance activity changes the location of the structure or alters any dimension of the structure by more than ten percent (10%), it shall be treated as a new/replacement hard shoreline stabilization structure and the City may require mitigation in accordance with this Program.

(9) Subdivisions shall be designed to assure that future development of the established lots will not require armoring. Use of a bulkhead, wall, or similar structure to protect a platted lot where no structure presently exists shall be prohibited.

(10) Breakwaters, jetties, rock weirs, groins and similar structural modifications shall be prohibited.

(11) New bulkheads on vacant lands are prohibited.

25.07.080 *Residential Use Regulations*

(1) **Preferred use**. Single-family residential use is a preferred shoreline use and shall be permitted when consistent with this Program and the Act, including the goal to ensure no net loss of shoreline ecological functions.

(2) **New Residential Development**. New residential development and normal appurtenances shall be located sufficiently landward of the OHWM to preclude the need for new structural shoreline stabilization and/or flood protection for the useful life of the structure in accordance with the following:

(a) New residential development and normal appurtenances shall be located landward of the shoreline setback, or if applicable the reduced shoreline setback, or as otherwise allowed, in accordance with this Program.

(b) For Shoreline Residential areas, impervious surface allowances shall be in accordance with R-4 zoning requirements, with the exception that no additional impervious surface percentage is allowed for lots less than 9,076 square feet. See SMC 21A.25.030 Note 4.c.

(c) For Urban Conservancy areas, the maximum amount of impervious surface shall not exceed 40% of the lot area above OHWM.

(d) New accessory structures, excluding accessory dwelling units, may be located waterward of the shoreline setback provided that all of the following criteria are met:

i. The maximum total footprint is not more than two hundred (200) square feet; and,

ii. The maximum height is not more than ten (10) feet above existing average grade level; and,

iii. The structure is located outside of wetlands, streams, other ecologically sensitive areas and associated buffers.

iv. Square footage of non-fixed landscaping features (single and clustered rocks used in landscaping, birdhouses, and items such as party tents, umbrellas and outdoor furniture, garden boxes, planters, and trellises) is not regulated.

(3) Expansion of Existing Legally Established Residential Use.

ATTACHMENT 5

US Army Corps of Engineers
Seattle District

Proposed Department of the Army Regional General Permit

RGP-3

Construction of New or Modification of Existing Residential Overwater Structures and Installation of Moorage Piling in Lake Washington, Lake Sammamish, the Sammamish River and Lake Union, Including the Lake Washington Ship Canal

Effective Date: March 7, 2005 **Expiration Date:** March 7, 2010

Permit Number: RGP-3

Permit Title: Residential Overwater Structures in Lake Washington, Lake Sammamish, Lake Union and Lake Washington Ship Canal

Authority: In accordance with 33 CFR 325.2(e)(2), the U.S. Army Corps of Engineers (Corps) is issuing this Regional General Permit 3 (RGP 3) that would authorize certain activities in or affecting waters of the United States, including navigable waters of the United States, upon the recommendation of the Chief of Engineers, pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (33 U.S.C. 1344).

Issuing Office: U.S. Army Corps of Engineers, Seattle District
Regulatory Branch, CENWS-OD-RG
Post Office Box 3755
Seattle, Washington 98124-3755
Telephone: (206) 764-3495

Purpose: The purpose of RGP 3 is to authorize the construction of new or modification of existing residential overwater structures and installation of moorage piling in Lake Washington, Lake Sammamish, the Sammamish River and Lake Union, including the Lake Washington Ship Canal.

Use of RGP-3: To use RGP 3, a prospective permittee must first notify the Corps of the proposed work in accordance with the application procedures (see page 2). ***A proposed project is not authorized under this RGP, and <u>work may not commence</u>, until the District Engineer or his designee has issued <u>written notification</u> that the proposed project meets the requirements of this RGP and is authorized.*** The permittee and all contractors performing work are responsible for ensuring that the authorized work complies with all applicable provisions of RGP 3, including any project-specific special conditions that may be added by the District Engineer. Failure to abide by the requirements of RGP 3 may constitute a violation of the Rivers and Harbors Act or the Clean Water Act. For purposes of this RGP, the term "permittee" shall include all successors in interest.

RGP-3 contains provisions intended to protect the environment, endangered species, and cultural resources. Work that will not comply with these provisions is not authorized by this RGP and may require Department of the Army authorization by a standard individual permit. Moreover, compliance with the provisions of RGP-3 does not itself guarantee that the work is authorized by this RGP.

Activities that appear to comply with the provisions of RGP 3 but would have an unacceptable adverse impact on the public interest are not authorized.

Location of Authorized Activities: RGP 3 is applicable in Lake Washington, Lake Sammamish, the Sammamish River and Lake Union, including the Lake Washington Ship Canal.

Activities Authorized by this RGP: Work authorized by RGP-3 is limited to the construction of new or modification of existing residential overwater structures including piers, floats, ramps and other similar structures and/or installation of moorage piling and future maintenance of authorized facilities. Once the work is authorized by RGP-3, any proposed modifications beyond the limitations of RGP-3 must be approved by a Department of the Army Individual Permit. This RGP only authorizes one pier/ramp/float structure per property. There are further limitations for joint use piers (see Application Procedures section below). Definitions of terms used in this RGP are located in Appendix F of this document.

This permit authorizes fill material placed for the purposes of fish habitat enhancement, as required by the Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife. Also, any Corps required mitigation measures for the overwater structures are also authorized by this RGP.

Application Procedure: Authorization under RGP 3 requires that a prospective permittee notify the Corps of the proposed work in accordance with the application procedures described in this section and not proceed with the proposed work until the District Engineer or his designee issues written notification that the proposed project meets the requirements of this RGP and is authorized. To notify the Corps of a proposed project that may qualify for authorization under this RGP, the prospective permittee must submit the following information:

1. A complete ***Specific Project Information Form (SPIF)*** for RGP 3 (see Appendix A). Submittal of a completed *SPIF* for RGP 3 constitutes the applicant's voluntary agreement to meet all of the requirements of this RGP.

2. A "complete application" including appropriate vicinity map, plan, profile, and cross-section drawings of the proposed work and structures and overwater structures on adjacent properties, as well as estimates of the volume of each type of material that would be discharged (temporarily or permanently) into waters of the United States (for assistance with preparation of the drawings, please refer to Appendix B, *Drawing Checklist*). A complete application must also incorporate appropriate impact reduction measures as discussed in the *Construction Specifications and Conservation Measures* section below (see paragraph 10).

3. A drawing showing the planting plan and species list (see Appendix C) must be included with the project drawings discussed above.

4. If the structure will be "joint use" you must:
   a. List all property owners using the joint use pier as co-applicants and they must sign the application form.
   b. Provide a joint use agreement signed by all involved property owners; the agreement must state that each property owner voluntarily agrees to build no overwater structures on their property except for the authorized joint use overwater structure.
   c. Show on a drawing the location of all properties involved in the joint use agreement.

5. For activities that may affect historic properties listed, or eligible for listing, in the National Register of Historic Places, the notification must include a description of each historic property that may be affected by the proposed work and a map indicating the location of the property.

6. Any other relevant information, such as photographs of the project area, a description of any offsite borrow site that would be used, and a copy of the HPA.

Upon receipt of a complete application, the Corps will forward a copy of the SPIF and any relevant information, including the HPA, to NOAA's National Marine Fisheries Service and the U.S. Fish and Wildlife Service (Services), and the Muckleshoot Indian Tribe. The Services and the Tribe will have 21 calendar days to provide comments on the application. If no comments are received, the Corps will complete its review, and if appropriate, issue written notification to the applicant that the proposed work meets the requirements of the RGP provided all other terms and conditions of the RGP are met.

If the Services or the Tribe raise any issues relating to the project, resolution of these issues must occur prior to the Corps confirming that the project meets the requirements of the RGP. If a resolution cannot be reached, the project may require additional information or may need to be processed using the Corps' individual permit procedures.

Construction Specifications and Conservation Measures: The following construction specifications and conservation measures must be implemented for the work to be authorized by this RGP:

1. Number of Overwater Structures. This permit authorizes the construction, expansion or modification of only one non-commercial, residential moorage facility per upland residential waterfront property owner or one joint-use moorage facility for two or more adjacent waterfront property owners.

2. Existing In-Water Structures. Any existing in-water and overwater structures within 30 feet of the ordinary high water (OHW) line (with the exception of bulkheads), except for those facilitating access as authorized by this permit, shall be removed and no additional in- or over-water structures shall be constructed in this nearshore area over the entire length of the property without notifying the Corps.

3. Pier, Ramp, Float, and Ell Specification Options. Note that only piers and ramps can be within the first 30 feet from shore. All floats and ells must be at least 30 feet waterward of OHW. No skirting is allowed on any structure.

   a. Surface Coverage (includes all floats, ramps, and ells):
      (1) Single property owner: 480 square feet
      (2) Two property owners (residential): 700 square feet
      (3) Three or more residential property owners: 1000 square feet.

   b. Height above the water surface: except for floats, the bottom of all structures must be at least 1.5 feet above OHW.

   c. Widths and lengths:
      (1) Piers - must not exceed a width of 4 feet and must be fully grated with at least 60% open area.
      (2) Ramps - must not exceed a width of 3 feet and must be fully grated.
      (3) Ells - must be in water with depths of 9 feet or greater at the landward end of the ell.
         a. Up to 6-feet wide by 20-foot long with a 2-foot strip of grating down the center.
         b. Up to 6-feet wide by 26-foot long with grating providing 60% open area over the entire ell.
         c. One 2-foot wide by 20-foot long, fully grated finger ell is allowed.

(4) Floats- must be in water with depths of 10 feet or more at the landward end of the float. Floats can be up to 6 feet wide and 20 feet long, but must contain a minimum of 2 feet of grating down the center of the entire float.

4. Length of Structures compared to Adjacent Structures. The length of a pier is limited by the maximum square footage allowed (see item no. 3 above). Any proposed pier that extends further waterward than adjacent piers will be reviewed on a case-by-case basis to assess impacts on navigation. Piers determined by the Corps to have an adverse effect on navigation are not authorized by this permit.

5. Piling Specifications. The first in-water (nearest shore) set of pilings shall be steel, 4" piling and at least 18' from the OHW. Piling sets beyond the first shall also be spaced at least 18 feet apart and shall not be greater than 12" in diameter. Piles shall not be treated with pentachlorophenol, creosote, CCA or comparably toxic compounds. If ACZA piling are proposed, the applicant will meet all of the Best Management Practices, including a post-treatment procedure, as outlined in the amended Best Management Practices of the Western Wood Preservers. All piling sizes are in nominal diameter.

   Steel piles will be installed using approved sound attenuation measures. These measures can be found on the Corps website: *http://www.nws.usace.army.mil/reg.html*.

6. Treatment of Overwater Structural Materials. Any paint, stain or preservative applied to components of the overwater structure must be leach resistant, completely dried or cured prior to installation. Materials shall not be treated with pentachlorophenol, creosote, CCA or comparably toxic compounds.

7. Existing Habitat Features. Existing habitat features (e.g., large and small woody debris, substrate material, etc.) shall not be removed from the riparian or aquatic environment. If invasive weeds (e.g., milfoil) are present and applicant wishes to remove them, removal shall occur by non-chemical means only with authorization from the Washington State Department of Fish and Wildlife.

8. Mooring Piles. This permit allows for no more than 2 mooring piles installed per structure authorized by this RGP. Joint-use structures can have up to 4 mooring piles. The 2-pile limit for individuals and 4-pile limit for joint-users shall include all existing mooring piles. Moorage piling shall not be installed within 30 feet of the OHW line; shall not be placed any further waterward than the end of the pier; and shall not be placed more than 12 feet from the pier. These piles shall be as far offshore as possible.

9. Future Maintenance of Facilities. Future maintenance of facilities authorized by this RGP are authorized provided there is no change in size, configuration, or use of the facility; that all maintenance is conducted in accordance with all conditions contained herein and in the RGP verification letter; and as long as no new species have been listed under the Endangered Species Act. Before doing any overwater or in-water maintenance, applicants must contact the Corps to determine whether a separate permit is necessary.

10. Impact Reduction Measures. The above-described construction measures will minimize impacts of these structures to the aquatic environment. However, because of cumulative impacts of numerous floating and stationary structures to be authorized under this RGP, impact reduction measures must be implemented. Impact reduction measures consist of planting emergent vegetation waterward of OHW (if site appropriate) and a zone of riparian vegetation a minimum of 10-feet wide along the entire length of the shoreline immediately landward of OHW. Joint-

use piers will require a planting plan covering all properties sharing the pier. A path 6-feet wide or less is allowed through the zone of riparian vegetation for access to the pier. Chemical fertilizers, herbicides and pesticides shall not be applied to the riparian zone.

The purpose of this zone is to establish a riparian plant community and associated food web that can be used by migrating salmonids as they pass through the project area. The vegetation will provide food, organic matter, and root structure for protection of juvenile fish in the near shore area. Woody debris from the buffer that enters the water will provide nutrients to the lake ecosystem. Therefore, woody debris shall not be removed from the water or shoreline.

A permittee is required to establish and preserve impact reduction plantings at the project site for the duration that the overwater structure is in place. The intent of the shoreline planting should be to provide a continuous native plant community along the shoreline. The impact reduction planting will consist of native shrubs and trees and, when possible, emergent vegetation. At least two native trees and three willow plants (See Appendix D) shall be included in the planting plan. Planting density and spacing should be commensurate with spacing recommended for each individual species. Prior to issuance of an RGP, the Corps must approve the prospective permittee's planting plan and species list and numbers. The impact reduction planting must be completed within 12 months of the Corps' issuance of an RGP to the permittee.

Other impact reduction measures may be proposed by the applicant, particularly if riparian plantings are not feasible, due to lack of space. These will be reviewed and approved by the Corps, the U.S. Fish and Wildlife Service and NOAA's National Marine Fisheries Service on a case-by-case basis.

11. Impact Reduction Planting Performance Standards. One hundred percent survival of all planted native trees and shrubs is required during the first and second years after planting. During the third through fifth years after planting 100 percent of the trees must survive and 80 percent survival of the remaining native plants is required. Individual plants that die must be replaced with native shrubs and trees taken from the approved species list (see Appendix C).

12. Impact Reduction Reports. Impact reduction reports must be submitted to the Corps for all projects as follows:

    a. A status report on impact reduction construction, including as-built drawings, must be submitted to the Corps 12 months from the date the Corps issues an RGP to the permittee. Status reports on impact reduction construction will be due annually to the Corps until the Corps accepts the as-built drawings. The permittee can meet this reporting requirement by submitting to the Corps a completed *Status Report for Impact Reduction Construction*, found in Appendix D.

    b. For impact reduction planting, monitoring reports will be due annually for 5 years from the date the Corps accepts the as-built drawings. The impact reduction monitoring report will include written and photographic documentation on tree and shrub mortality and replanting efforts. The permittee can meet this reporting requirement by submitting to the Corps a completed *Impact Reduction Monitoring Report*, found in Appendix E.

13. Allowable Work Windows for Bald Eagles. The prospective permittee agrees to abide by the work window established by the Corps (please refer to the Corps, Seattle District, Regulatory Branch Internet homepage, *http://www.nws.usace.army.mil/reg.html* for the current listing of approved work windows). Adherence to these timing windows is necessary, in most cases, to maintain a not likely to adversely affect (NLAA) determination if all other measures have

reduced the project impacts to this level. Variations in this work window are based on the distance of the proposed project to the nearest bald eagle nest and wintering concentration. The Corps will coordinate with the U.S. Fish and Wildlife Service to determine the appropriate work window once an application is submitted.

14. Allowable Work Windows for Listed Fish Species. In addition to the work windows for bald eagles listed above, work must comply with established fish work windows for the corresponding portion of Lake Washington, Lake Sammamish, the Sammamish River or Lake Union, including the Lake Washington Ship Canal. (Please refer to the Corps, Seattle District, Regulatory Branch Internet homepage, *http://www.nws.usace.army.mil/reg.html* for the current listing of approved work windows.)

15. Work in the Dry. Work that disturbs the substrate, bank, or shore of a water of the United States shall occur in the dry whenever practicable.

16. Operation of Equipment. Equipment shall be operated from the top of the bank, dry gravel bar, work platform, or similar out-of-water location whenever possible. Equipment shall be operated in a manner that minimizes the suspension of particulates. All equipment used in or around waters shall be clean and inspected daily prior to use to ensure that the equipment has no fluid leaks. Should a leak develop during use, the leaking equipment shall be removed from the site immediately and not used again until it has been adequately repaired. Equipment should be stored and/or fueled at least 100 feet from any surface water where possible.

17. Disturbance of Vegetation. Disturbance of bank vegetation shall be limited to the minimum amount necessary to accomplish the project. Disturbed bank vegetation shall be replaced with native, locally adapted herbaceous and/or woody vegetation. Herbaceous plantings shall occur within 48 hours of the completion of construction. Woody vegetation components shall be planted in the fall or early winter, whichever occurs first. The applicant shall take appropriate measures to ensure revegetation success.

18. Isolation of Work Area. In-water work areas shall be isolated from the surrounding waterbody by properly installed silt screen or similar sediment containment device whenever practicable. The permittee shall remove these temporary sediment containment devices as soon as the devices are no longer necessary to protect the surrounding waterbody.

19. Proximity to Wetlands. No structure permitted herein shall be installed in or within 100-feet of a of either side of the mouth of any river, stream, or creek. Structures in or within 100-feet of a wetland must avoid impacts to the wetland to the maximum extent possible. "Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

20. Navigation and Access to Adjacent Structures and Property. The permitted activity must not interfere with the public's right to free navigation on navigable waters of the United States, including ingress and egress to adjacent waterfront structures and property.

Water Quality Certification: The Corps requested that the Washington Department of Ecology (Ecology), pursuant to Section 401 of the CWA and Chapters 173-225 of the Washington Administrative Code (WAC) and the requirements of the U.S. Coastal Zone Management Act (16 U.S.C. 1452 et seq.) and its implementing regulations (15 CFR 923-930), certify that those activities authorized by this RGP for which Ecology is responsible will not violate established State of Washington water quality standards

and will be consistent with the requirements of the State of Washington's Coastal Zone Management (CZM) program. On August 7, 2003, Ecology provided the required 401Water Quality Certification. By not acting on the Corps request for Certification of Consistency with the Washington Coastal Zone Management Program, state agency concurrence is presumed.

Endangered Species: The Endangered Species Act of 1973 (ESA), as amended, requires all Federal agencies to consult with NOAA's National Marine Fisheries Service and/or the U.S. Fish and Wildlife Service (USFWS), pursuant to Section 7 of the ESA, on any action, or proposed action, permitted, funded, or undertaken by the agency that may affect a species listed as threatened or endangered under the ESA, or its designated critical habitat. The Corps has completed consultation and received concurrence.

Essential Fish Habitat: The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, requires all Federal agencies to consult with NOAA's National Marine Fisheries Service on all actions, or proposed actions, permitted, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH). The Corps has determined that issuance of this RGP may adversely affect EFH for federally managed fisheries in Washington waters, the Corps has completed consultation with NOAA's National Marine Fisheries Service.

Permit Conditions: Department of the Army authorization under this RGP is subject to the following general conditions:

GENERAL CONDITIONS

1. Reliance on Permittee's Information. In verifying a permittee's authorization under this RGP, the Department of the Army has relied, in part, on the information provided by the permittee. If this information proves to be false, incomplete, or inaccurate, the permittee's authorization may be modified, suspended, or revoked, in whole or in part.

2. Compliance with Terms and Conditions. Projects authorized by this RGP shall comply with all terms and conditions herein and any case-specific conditions added by the Corps, State, or Environmental Protection Agency or a tribe as a result of a water quality certification. Failure to abide by these terms and conditions invalidates this authorization and may result in a violation of Federal law, which may require that the permittee restore the site or take other remedial action. Activities requiring Department of the Army authorization that are not specifically authorized by this RGP are prohibited unless authorized by another Department of the Army permit.

3. Contractor's Copy of Permit. The permittee shall provide complete copies of this permit and the Corps verification letter for the authorized project to each contractor involved in the project and keep copies of this permit and Corps verification letter available for inspection at the project site.

4. Compliance Certification. Every permittee shall submit to the Corps, within 30 days of completing the authorized work, certification that the work, including any required impact reduction, was conducted in accordance with the provisions of this RGP, including case-specific special conditions. The permittee must use the *Statement of Compliance Form* (Appendix D) of this RGP.

5. Access for Inspection. The permittee shall allow the District Engineer or his authorized representative to inspect the project whenever deemed necessary to ensure that the activity is in compliance with the terms and conditions prescribed herein.

6. Limits of Authorization. This permit does *not*:

   a. Obviate the requirement to obtain all other Federal, State, or local authorizations required by law for the activity authorized herein, including any authorization required from Congress.

   b. Convey any property rights, either in real estate or material, or any exclusive privileges.

   c. Authorize any injury to property, invasion of rights, or any infringement of Federal, State, or local laws or regulations.

   d. Authorize the interference with any existing or proposed Federal project.

7. Limits of Federal Liability. This permit is not an approval of the design features of any authorized project or an implication that such project is adequate for the intended purpose; a Department of the Army permit merely expresses the consent of the Federal Government to conduct the proposed work insofar as public rights are concerned. In issuing this RGP, the Federal Government does not assume any liability for the following:

   a. Design or construction deficiencies associated with the authorized work.

   b. Damages to the permitted project or uses thereof as a result of other permitted activities or from natural causes, such as flooding.

   c. Damages to persons, property, or to other permitted or unauthorized activities or structures caused by the activity authorized by this permit.

   d. Damages associated with any future modification, suspension, or revocation of this permit.

   e. The removal, relocation, or alteration of any structure or work in navigable waters of the United States ordered by the Secretary of the Army or his authorized representative.

   f. Damage to the permitted project or uses thereof as a result of current or future activities undertaken by, or on behalf of, the United States in the public interest.

8. Tribal Rights. No activity may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

9. Corps Coordination. Permittees shall coordinate with the appropriate office of the Corps prior to commencing any construction activity in a federally maintained channel and/or waterway

10. Obstruction of Navigation. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration of the work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work unreasonably obstructs the full and free use of navigable waters of the United States, the permittee shall, upon due notice from the Corps, remove, relocate, or alter the obstructions caused thereby, without expense to the United States. If the permittee fails to comply with the direction of the Corps, the District Engineer may restore the navigable capacity of the waterway, by contract or otherwise, and recover the cost thereof from the permittee.

11. Stability. The permittee shall design projects to be stable against the forces of flowing water, wave action, and the wake of passing vessels.

12. Maintenance. The permittee shall properly maintain all authorized structures, including maintenance necessary to ensure public safety.

13. Marking Structures. The permittee shall install and maintain any lights, signals, or other appropriate markers necessary to clearly designate the location of structures or work that might pose a hazard to public safety. Permittees shall abide by U.S. Coast Guard requirements concerning the marking of structures and work in navigable waters of the United States.

14. Endangered Species. This RGP does not authorize any activity that is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the ESA.

15. Essential Fish Habitat. This RGP does not authorize any activity that may adversely affect designated Essential Fish Habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act.

16. Historic Properties. This RGP does not authorize any activity that may affect historic properties listed, or eligible for listing, in the National Register of Historic Places (NRHP) until the provisions of 33 CFR 325, Appendix C, have been satisfied. Historic properties include prehistoric and historic archeological sites, and areas or structures of cultural interest. A prospective permittee must notify the District Engineer if the proposed activity may affect a historic property that is listed, eligible for listing, or may be eligible for listing in the NRHP, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. If a previously unknown historic property is encountered during work authorized by this RGP, the permittee shall immediately cease all ground activities in the immediate area, notify the Corps within 1 business day of discovery. The permittee shall perform any work required by the Corps in accordance with Section 106 of the National Historic Preservation Act and Corps regulations and avoid any further impact to the property until the District Engineer verifies that the requirements of 33 CFR Part 325, Appendix C, have been satisfied.

17. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status unless the appropriate federal agency (e.g. National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service), with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

18. Water Quality Standards. All activities authorized herein that involve a discharge of dredged or fill material into waters of the United States shall, at all times, remain consistent with all applicable water quality standards, effluent limitations and standards of performance, prohibitions, pretreatment standards, and management practices established pursuant to the Clean Water Act (P.L. 92-500; 86 Stat. 816) or pursuant to applicable State and local law.

19. Minimization of Environmental Impact. The permittee shall make every reasonable effort to conduct the authorized activities in a manner that minimizes the adverse impact of the work on water quality, fish and wildlife, and the natural environment, including adverse impacts to migratory waterfowl breeding areas, spawning areas, shellfish beds, and aquatic resource buffer zones.

20. Soil Erosion and Sediment Controls. The permittee shall use and maintain appropriate erosion and sediment controls in effective operating condition and permanently stabilize all exposed soil and

other fills, including any work below the ordinary high water mark or high tide line, at the earliest practicable date using native vegetation to the maximum extent practicable. The permittee shall remove all installed controls as soon as they are no longer needed to control erosion or sediment.

21. Equipment. The permittee shall place heavy equipment working in wetlands on mats, or take other appropriate measures to minimize soil disturbance.

22. Aquatic Life Movements. The permittee shall not substantially disrupt the necessary life-cycle movement of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the primary purpose of the activity is to temporarily impound water.

23. Management of Water Flows. To the maximum extent practicable, the activity must be designed to maintain downstream flow conditions. Furthermore, the activity shall not permanently restrict or impede the passage of normal or expected high flows. The permittee should limit the work conducted in waters of the United States to low- or no-flow periods.

24. Water Supply Intakes. The permittee shall ensure that activities authorized by this RGP have no more than a minimal adverse impact on public water supply intakes.

25. Practicable Alternatives. Activities authorized by this RGP shall be designed and constructed to avoid and minimize adverse impacts to waters of the United States to the extent practicable through the use of practicable alternatives.

26. Suitable Material. Any material or structure placed in waters of the United States, whether temporary or permanent, shall be free of toxic pollutants in toxic amounts.

27. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected area returned to pre-construction contours.

28. Disposal of Excess Material. All construction debris and any other material not authorized by the Corps for permanent placement into waters of the United States shall be disposed of in an upland location in a manner that precludes it from entering waters of the United States.

Modification, suspension, or revocation of the RGP: This RGP may be modified or suspended in whole or in part if the Secretary of the Army or his authorized representative determines that the individual or cumulative impacts of work that would be authorized using this procedure are contrary to the public interest. Any such modification, suspension, or revocation shall become effective 30 days after the issuance of a public notice announcing such action. The final decision whether to modify, suspend, or revoke this permit, in whole or in part, shall be made pursuant to procedures prescribed by the Chief of Engineers. Following such revocation, any future activities heretofore authorized by this RGP will require alternate Department of the Army authorization.

The authorization of an individual project under this RGP may also be summarily modified, suspended, or revoked, in whole or in part, if the permittee either fails to abide by the terms and conditions of this permit or provides information that proves to be false, incomplete, or inaccurate, or upon a finding by the District Engineer that such action would be in the public interest. If a permittee's authorization is revoked, the permittee shall, upon notice of such revocation, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the waterway to its former condition. If the permittee fails to comply with the direction of the Secretary

of the Army or his authorized representative, the Secretary or his designee may restore the waterway to its former condition, by contract or otherwise, and recover the cost thereof from the permittee.

Expiration of the RGP: This permit shall become effective on the date of the signature of the District Engineer or his authorized representative and will automatically expire 5 years from that date unless the permit is modified, revoked, or extended prior to that date. Activities that have commenced (e.g., are under construction) or are under contract to commence in reliance upon this permit will remain authorized provided that the activity is completed within 1 year of the date of this permit's expiration, modification, or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:

7 March 2005
Date

Michelle Walker for
DEBRA M. LEWIS
Colonel, Corps of Engineers
District Engineer

ATTACHMENT 5

APPENDIX A

US Army Corps of Engineers ®
Seattle District

REGIONAL GENERAL PERMIT 3
APPLICATION FORM
For Construction of New or Modification of Existing Residential Overwater Structures and Drive Moorage Piling in Lake Washington, Lake Sammamish, the Sammamish River and Lake Union, Including the Lake Washington Ship Canal, in the State of Washington

Version March 7, 2005

TO BE COMPLETED BY THE CORPS
Corps Reference Number _____
☐ The proposed work meets all of the conditions of RGP 3.
☐ The proposed work does not meet all of the conditions of RGP 3. This form constitutes a Reference Biological Evaluation.
USFWS Reference: 1-3-04-PI-00560 NMFS Reference: 2004/00175

1. **Biological Evaluation:**
   Biological Evaluation for Construction of New or Modification of Existing Residential Overwater Structures and Installation of Moorage Piling in Lake Washington, Lake Sammamish, the Sammamish River and Lake Union, Including the Lake Washington Ship Canal, in the State of Washington June 26, 2003. U.S. Army Corps of Engineers, Seattle District, Regulatory Branch.
2. **Date**: _____
3. **Applicant' Name**: _____
   Address: _____
   City: _____ State: _____ Zip: _____
4. **Agent' Name:** _____
   Address: _____
   City: _____ State: _____ Zip: _____
5. **Location(s) of Activity:**
   Quarter Section: _____ Section: _____ Township: _____ Range: _____
   Latitude: _____ Longitude: _____
   Street address: _____
   Waterbody: _____ County: _____
   Names and Addresses of Adjacent Property Owners:
   _____
   _____
6. **Use type:** ☐ Private non-commercial ☐ Private Joint-use[a] non-commercial

[a] Joint use requires at least two contiguous residential waterfront property owners.

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Name and address of joint-use property owner(s):

_____

_____

7. **Project description:** _____

_____

_____

_____

8. **Construction techniques:**

a. Describe how the piling will be installed. Include the type of equipment, tools, and machinery to be used:

_____

_____

b. Describe how the pier, ramp, and float will be constructed, transported, and installed. Include the type of equipment, tools, and machinery to be used:

_____

_____

_____

_____

_____

_____

c. The number of days it will take to complete the project: _____

d. Describe the methods proposed to prevent construction debris from entering the water or causing water quality degradation: _____

_____

_____

_____

_____

Endangered Species Act (ESA) Information: Specific Project Information

Conservation Measures and Construction Specifications: In order to meet all ESA requirements for authorization under this Regional General Permit (RGP), all applicable Conservation Measures and Construction Specifications summarized below must be implemented. The entire text of the Conservation Measures and Construction Specifications are listed in the RGP document. Check each item that you agree to implement. Check each item "not applicable" if they do not apply to your project. For example, if you will not install piling, check "not applicable" next to the item listing the piling requirements. You must also complete the column on the right with your specific project information.

I (We) Will Implement	I (We) Will Not Implement	Not Applicable	Conservation Measure and Construction Specification	Specific Project Information
☐	☐	☐	Existing in-water and over-water structures (with the exception of bulkheads) with 30 feet of OHW, except for those facilitating access, shall be removed and no additional in-water structures shall be	Existing in-water and over-water structures that will be removed: _____

ATTACHMENT 5

I (We) Will Implement	I (We) Will Not Implement	Not Applicable	Conservation Measure and Construction Specification	Specific Project Information
			constructed in this nearshore area over the entire length of the property.	
☐	☐	☐	Only piers and ramps can be within 30 feet of shore. All floats and ells must be at least 30 feet waterward of OHW.	
☐	☐	☐	Skirting: Skirting is not authorized by this RGP and any existing skirting must be removed.	
☐	☐	☐	New Piers: Surface coverage of pier must not exceed the following: a. Single property owner- 480 square feet b. Two property owners- 700 square feet c. Three or more property owners- 1000 square feet	size of proposed pier: _____ square feet
☐	☐	☐	Except for floats, the bottom of all structures must be at least 1.5 feet above OHW.	distance of bottom of pier from OHW
☐	☐	☐	Pier/walkway must be fully grated.	_____ % open area
☐	☐	☐	Pier/walkway must be no wider than 4 feet.	width of proposed pier: _____ feet
☐	☐	☐	Ramps must not exceed 3 feet in width and be fully grated.	width of proposed ramp: _____ feet
☐	☐	☐	Ells must not exceed than 6-foot wide by 20-foot long with a 2-foot wide strip of grating down the center OR 6-foot wide by 26-foot long and fully grated.	length of ell: _____ feet width of ell: _____ feet
☐	☐	☐	Finger ell must be no wider than 2-foot wide and no longer than 20-foot long and fully-grated.	length of ell: _____ feet width of ell: _____ feet
☐	☐	☐	Float width must not exceed 6 feet and the length cannot exceed 20 feet.	width of proposed float: _____ feet length of proposed float: _____ feet
☐	☐	☐	Floats must contain at least a two foot strip of grating down the center	
☐	☐	☐	All grating must have at least 60% open area.	Proposed grating has _____ % open area
☐	☐	☐	Piling: The first in-water set of piles shall be steel, 4-inch and at least 18-feet from OHW.	Type of material and size of first set of piling;
☐	☐	☐	Beyond the first set of piles, piles for a new pier must be spaced no closer than 20 feet apart and no greater than 12-inces in diameter.	Number of proposed piling supporting the new pier: _____ Size of piling beyond the first set: _____
☐	☐	☐	Piling beyond the first set: Replacement or proposed new piling can be steel, concrete, plastic or untreated or treated wood.	Type of material for piling: _____
☐	☐	☐	A maximum of 2 (two) moorage piling (or 4 for joint-use) may be	Number of proposed

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I (We) Will Implement	I (We) Will Not Implement	Not Applicable	Conservation Measure and Construction Specification	Specific Project Information
			installed to accommodate the moorage of boats exceeding the length of the floats.	mooring piling: _____
☐	☐	☐	Moorage piling shall be at least 30-feet waterward of OHW and no further than 12 feet from the end of the pier.	Distance of piling from OHW:_____ Distance of piling from pier: _____
☐	☐	☐	If an impact hammer pile driver for steel piling is utilized, a sound attenuation device or system must be implemented during pile driving. Steel piling cannot exceed a 12-inch diameter.	Diameter of steel piling: _____ feet
☐	☐	☐	1. Piling with diameter of 10 inches or less – one Corps approved sound attenuation device is required	Type of sound attenuation device: _____
☐	☐	☐	2. For piling with a diameter greater than 10 inches, up to 12 inches, two Corps approved sound attenuation devices are required	Type of sound attenuation devices: _____
☐	☐	☐	Treated Wood: No creosote, pentachlorophenol, CCA, or comparably toxic compounds not approved for marine use, shall be used for any portion of the over water structure. ACZA treated wood must meet Post-Treatment Procedures.	If treated wood will be used, list type of treatment: _____ You must also submit certification that the wood was treated by the appropriate and approved Post Treatment Procedures before authorized work can commence.
☐	☐	☐	Invasive aquatic weeds are present and applicant will remove by non-chemical means.	
☐	☐	☐	Impact Reduction Measures: Applicant will plant emergent vegetation.	
☐	☐	☐	Impact Reduction Measures: Applicant will plant a ten-foot wide strip of vegetation along the entire of the shoreline (including shorelines of any joint-use applicants). A six-foot wide path through the vegetation is allowed for access to the pier.	
☐	☐	☐	Impact Reduction Plantings: The authorized species, number of plants, and correct spacing of plants will be utilized.	Attach planting plan.
☐	☐	☐	Impact Reduction Planting Performance Standards- The required performance standards will be met for the 5-year monitoring period: a. 100% survival of all trees and shrubs for the first two years. b. 100% of trees and 80% of shrubs must survive years 3-5.	
☐	☐	☐	Impact Reduction Reports: A status report on the project and mitigation, including as-built drawings, must be submitted to the Corps within 12 months from the date the Corps issues an RGP to the permittee. **P**lanting monitoring reports will be due annually for 5 years from the date.	
☐	☐	☐	Fish Work Windows: The required RGP fish work window will be met. Note: The RGP fish work window may be different than the HPA work window. For the work to be authorized by this RGP, the RGP fish work window must be met.	Fish work window at this project location is (per Corps' website): _____
☐	☐	☐	Bald Eagle Work Window: Required bald eagle work windows will be met, if applicable to the project location. General work prohibition times: January 1 through August 15 (nesting areas) November 1 through March 31 (wintering areas)	The required bald eagle work window at this project location will be determined by the Corps

ATTACHMENT 5

I (We) Will Implement	I (We) Will Not Implement	Not Applicable	Conservation Measure and Construction Specification	Specific Project Information
☐	☐	☐	Work in the Dry: Work that disturbs the substrate, bank, or shore shall occur in the dry whenever practicable.	
☐	☐	☐	Operation of Equipment: Equipment shall be operated from the top of the bank, dry gravel bar, temporary work platform, barge, or similar out-of-water location.	
☐	☐	☐	Equipment shall be operated in a manner that minimizes suspended particulates from entering the water column.	
☐	☐	☐	All equipment used in or around waters shall be clean and inspected daily prior to use to ensure that the equipment has not fluid leaks. Any equipment that develops a leak shall be removed from the site immediately and not used again until it has been adequately repaired.	
☐	☐	☐	All General Conditions will be met.	
☐	☐	☐	A copy of this permit, permit drawings, mitigation planting plan, and final authorization letter shall be recorded with the Registrar of Deeds, within 60 days after final Corps authorization, to ensure that subsequent property owners are aware of the construction, use, and mitigation requirements. Proof of this must be provided to the Corps within 65 days after the date of the Corps' RGP verification letter to the permittee. **If the pier is joint use**, all co-applicants must voluntarily agree to build no additional overwater structures on their property, except for the maintenance or modification of the proposed joint use overwater structure. This voluntary agreement and the documentation described above must be recorded on the deeds of all involved properties. (General Condition 3)	

9. **Essential Fish Habitat, area affected (square footage of pier, ramp, and float):** _____

10. **Drawings:** Attach a vicinity map and project drawings (plan and elevation views required). Photographs are recommended.

11. **Planting plan:** Attach copy of planting, monitoring, and contingency plan for riparian area.

If the applicant has <u>checked "will not implement" for any of the above items</u>, then the following items must be completed by the applicant:

☐ You must attach a completed Coastal Zone Management form.

Note: This form can be found on the Corps' web page: www.nws.usace.army.mil/reg.html

☐ Based on the existing environmental conditions and the proposed work, the applicant is proposing additional impact reduction measures (beyond the requirements of Construction Specification 10) as described below: _____

List those Conservation Measures that will not be met by this project. Describe why they won't be met:

_____

_____

_____

_____

_____

ATTACHMENT 5

APPLICATION IS HEREBY MADE FOR A PERMIT OR PERMITS TO AUTHORIZE THE ACTIVITIES DESCRIBED HEREIN. I CERTIFY THAT I AM FAMILIAR WITH THE INFORMATION CONTAINED IN THIS APPLICATION, AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, SUCH INFORMATION IS TRUE, COMPLETE, AND ACCURATE. I FURTHER CERTIFY THAT I POSSESS THE AUTHORITY TO UNDERTAKE THE PROPOSED ACTIVITIES. I HEREBY GRANT TO THE AGENCIES TO WHICH THIS APPLICATION IS MADE, THE RIGHT TO ENTER THE ABOVE-DESCRIBED LOCATION TO INSPECT THE PROPOSED, IN-PROGRESS, OR COMPLETED WORK. I VOLUNTARILY AGREE TO MEET ALL REQUIREMENTS OF THIS RGP. I AGREE TO START WORK ONLY AFTER ALL NECESSARY PERMITS HAVE BEEN RECEIVED.

Signature of Applicant	Date
Signature of Authorized Agent	Date
Signature of Contractor (if Contractor is known)	Date

ATTACHMENT 5

APPENDIX B

Drawing Checklist

1. GENERAL

- ☐ Use clear black lettering and fewest number of sheets possible; use 8 ½- by 11-inch sheets
- ☐ State the purpose of the proposed or existing work
- ☐ List property owners and indicate number by number on plan view drawing
- ☐ Show datum used in plan and elevation drawings
- ☐ Use a graphic scale on all drawings
- ☐ Use a north arrow; prepare drawing with north being directed to the top of the page
- ☐ Label all proposed and existing work as such (e.g., Proposed Pier, Proposed Fill…)

2. TITLE BLOCK

☐ A completed title block (first example) must be on every sheet; for subsequent sheets you can use the abbreviated form (second example). All sheets will include the date and/or revision date.

PURPOSE: DATUM: ADJACENT PROPERTY OWNERS: 1. 2.	APPLICANT 2002- LOCATION ADDRESS	PROPOSED: IN: NEAR/AT: COUNTY: STATE: WA SHEET * OF * DATE:

Reference: 2002- Applicant: Proposed: At Washington Sheet * of * Date

3. VICINITY MAP

- ☐ Clearly show location of project (e.g., arrow, circle, etc.)
- ☐ List latitude, longitude, section, township, and range
- ☐ Name waterways
- ☐ Show roads, streets, and/or mileage to nearest town or city limits

4. PLAN VIEW

☐ Show shorelines:

Tidal: Show mean high water (MHW) line, mean higher high water (MHHW) line

Lakes or streams: Show the ordinary high water (OHW) line

☐ Show dimensions of proposed structures/fills; distance to property lines; encroachment beyond applicable shoreline; show wetland boundaries and specific impacts to wetlands

- ☐ Indicate location, quantity, and type of fill, if any
- ☐ Show all existing structures or fills on subject and adjacent properties
- ☐ Show direction of currents such as tidal ebb and flood
- ☐ Indicate adjacent property ownership

5. ELEVATION AND/OR SECTION VIEW

- ☐ Show shorelines, MHW line, MHHW line, OHW line, wetland boundary
- ☐ Show original and proposed elevations, water depths, dimensions of proposed structures or fills, and pertinent vertical dimensions to top and base of structure/fill; use the same vertical and horizontal scale, if possible
- ☐ Use equal horizontal and vertical scales on Section View. Do not skew vertical scale.

For Example Drawings: http://www.nws.usace.army.mil/PublicMenu/Menu.cfm?sitename=REG&pagename=Drawing_Samples

ATTACHMENT 5

APPENDIX C

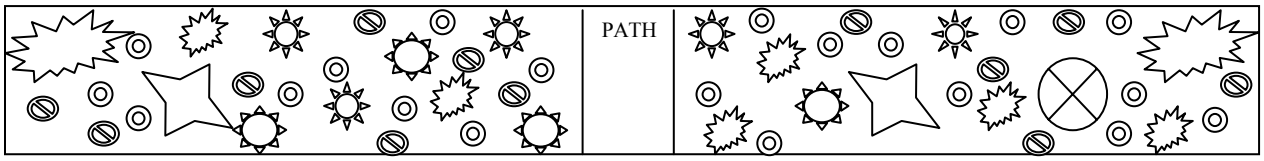
Below is a list of approved plant species and a sample planting plan. The applicant can suggest other species but the Corps must approve the species before work commences. Updates to this list may be found on the Corps website: http://www.nws.usace.army.mil/reg.html.

Common Name	Scientific Name
Willow spp.	
Sitka willow	*Salix sitchensis*
Souler willow	*S. scouleriana*
Sandbar willow	*S. exigua*
Pacific willow	*S. lasiandra*
Hooker willow	*S. hookeriana*
Conifers	
Douglas fir	*Pseudotsuga menzeisii*
Sitka spruce	*Picea sitchensis*
Shore pine or Lodgepole pine	*Pinus contorta*
Ponderosa pine	*Pinus ponderosa*
Grand fir	*Abies grandes*
Western hemlock	*Tsuga heterophylla*
Western red cedar	*Thuja plicata*
Other Trees	
Black cottonwood	*Populus trichocarpa*
Cascara	*Rhamnus purshiana*
Big leaf maple	*Acer macrophyllum*
Alnus rubra	*Red alder*
Birch species	*Betula spp.*
Pacific dogwood	*Cornus nuttalii*
Bitter cherry	*Prunus emarginata*
Large shrubs	
Red osier dogwood	*Cornus stolonifera*
Red flowering currant	*Ribes sanguineum*
Nootka rose	*Rosa nutkana*
Baldhip rose	*Rosa gymnocarpa*
Thimbleberry	*Rubus parviflorus*
Red elderberry	*Sambucus racemosa*
Vine maple	*Acer circinatum*
Western serviceberry	*Amelanchier alnifolia*
Ocean spray	*Holodiscus discolor*
Hazelnut	*Corylus americana*
Sweet gale	*Myrica gale*
Small shrubs/groundcover	
Salal	*Gaultheria shallon*
Oregon grape	*Berberis nervosa*
Black twinberry	*Lonicera involucrata*
Sword fern	*Polystichum munitum*
Snowberry	*Symphoricarpos albus*
Deer fern	*Blechnum spicant*
Emergent vegetation	
Hardstem bulrush	*Scirpus acutus*
Daggerleaf rush	*Juncus ensifolius*
Small fruited bulrush	*Scirpus microcarpus*

ATTACHMENT 5

SAMPLE PLANTING PLAN

PLAN VIEW
Scale:
1 inch = 10 feet
10-foot wide by 65-foot long



LEGEND

TREE SPECIES

willow species, generally on 10-foot centers

conifer, generally on 10-foot centers

other tree, generally on 10-foot centers

SHRUB SPECIES

large shrub, generally on 4 to 7-foot centers

large shrub, generally on 4 to 7-foot centers

large shrub, generally on 4 to 7-foot centers

small shrub, generally on 1 to 4-foot centers

small shrub, generally on 1 to 4-foot centers

ATTACHMENT 5

APPENDIX D

Status Report for Impact Reduction Construction - RGP-3

Within one (1) year of the date your permit was issued, submit this completed form to: U.S. Army Corps of Engineers, Regulatory Branch, Post Office Box 3755, Seattle, Washington 98124-3755.

Corps' Reference Number: _____

Date the Corps Issued Your Permit: _____

Date this Report is Due: _____

Date Work was Completed: _____

Your Name: _____

Your Address: _____

Your City/State/Zip Code: _____

Your Phone Number: _____

You must attach to this form: ☒ As-built drawing(s) of planting areas (if installed), and
☒ Photographs of the mitigation area.

Describe impact reduction construction performed: _____

_____

If plantings were installed:

Conditions of your Corps permit require at least two trees be planted in each planting plot. The vegetation you plant must be taken from this list of native species found in Appendix C or you can suggest other species but the Corps must approve the species before planting commences. Shrubs should be planted at 3-feet-on-center intervals and trees should be planted at 10-feet-on-center intervals. Be sure to protect your plantings—fencing is recommended.

Name of Species You Planted	Number Planted
Total Planted:	

Native tree list: Populus trichocarpa, Pseudotsuga menziesii, Picea sitchensis, Pinus contorta
Native shrub list: Salix sitchensis, S. scouleriana, S. exigua, S. hookeriana, S. lasiandra, Cornus stolonifera
(See Appendix C for a more complete list of acceptable species)

I hereby certify that I have completed the work in compliance with the terms and conditions of this permit, including any project-specific conditions required by the District Engineer to ensure that this work would have no more than minimal adverse impact on the aquatic environment.

_____ _____
Signature of Permittee Date

_____ _____
Signature of Contractor Date

ATTACHMENT 5

APPENDIX E

Mitigation Planting Monitoring Report for RGP - 3

Submit this completed form to: U.S. Army Corps of Engineers, Regulatory Branch, P.O. Box 3755, Seattle, WA 98124-3755. A completed form must be submitted 1, 2, 3, 4 and 5 years after the Corps accepts your as-built drawing of the mitigation planting area.

Corps' Verification Reference Number: _____

Date Your As-Builts Were Accepted by the Corps _____

Date This Report Is Due: _____

Your Name: _____

Your Address: _____

Your City/State/Zip Code: _____

Your Phone Number: _____

You must attach to this form: ☒ Photographs of the mitigation area taken within the last month.

Conditions of your Corps permit require 100% survival of all planted trees and shrubs during the first and second years after planting. During the third through fifth years after planting, 80% survival is required. Individual plants that die must be replaced with a species from the list below or you can suggest other species but the Corps must approve the species before planting commences. At least two trees must be planted in your mitigation area. You must protect your mitigation area—fencing is recommended.

Date of Inspection	Species name of Dead Plants	Number of Dead Plants	Name of Species Replanted	Number Replanted

Native tree list: *Populus trichocarpa, Pseudotsuga menziesii, Picea sitchensis, Pinus contorta*
Native shrub list: *Salix sitchensis, S. scouleriana, S. exigua, S. hookeriana, S. lasiandra, Cornus stolonifera*

ATTACHMENT 5

APPENDIX F

Definitions

"Joint-use" piers, floats, and ramps are constructed by more than one contiguous residential waterfront property owner or by a homeowner's association.

"In-water structures" include wharves, walkways, piles, swim steps associated with a pier, boatlifts, and boathouses.

"Overwater structures" include piers, ramps, floats, and their associated structures. Associated structures include piling, chain and anchors for floats, ladders, steps, and swim steps.

"Skirting" is vertical boards along the edge of a pier extending downward.

The *"Ordinary High Water"* (OHW) mark or line is at an elevation of 21.8 feet for Lake Washington, Lake Union, and the Lake Washington Ship Canal (Corps of Engineers datum) and 27.0 for Lake Sammamish (National Geodetic Vertical Datum). For the Sammamish River connecting Lake Sammamish and Lake Washington, it is the visible line on the banks where the presence and action of waters are so common as to leave a mark upon the soil or vegetation. (Note: The State of Washington has a different definition of OHW).

The *footprint* of an overwater structure is the total surface area (square feet) of all the structure's components (e.g., pier, ramp and/or floats).

Heavy equipment includes but is not limited to bulldozers, pile drivers, aquatic construction equipment**,** back-end loaders, barges, jackhammers, and cement mixers.

A *Spill Prevention Control and Countermeasures Plan* (SPCC plan) is a comprehensive description of containment and countermeasures that would prevent an oil spill from occurring as well as procedures to respond to and clean up an oil spill that does occur. The Clean Water Act requires preparation of a SPCC plan by any facility that stores, transports, or handles oil and could reasonably be expected to discharge oil in a harmful quantity to navigable water.

ATTACHMENT 5

US Army Corps of Engineers
Seattle District

Department of the Army Regional General Permit

RGP 1
Watercraft Lifts
In fresh and marine/estuarine waters
Within the State of Washington

Effective Date: February 14, 2005 **Expiration Date:** February 14, 2010
Revised Date: January 29, 2007

Permit Number: RGP 1

Permit Title: Watercraft Lifts in certain fresh and marine/estuarine waters within the State of Washington.

Authority: In accordance with 33 CFR 325.2(e)(2), the Seattle District of the U.S. Army Corps of Engineers (Corps) is issuing Regional General Permit 1(RGP 1) that authorizes watercraft lifts and canopies in certain fresh and marine/estuarine waters within the State of Washington upon the recommendation of the Chief of Engineers, pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act.

Issuing Office: U.S. Army Corps of Engineers, Seattle District
Regulatory Branch, CENWS-OD-RG
Post Office Box 3755
Seattle, Washington 98124-3755
Telephone: (206) 764-3495

Purpose: The purpose of RGP 1 is to authorize watercraft lifts and canopies in certain fresh and marine/estuarine waters within the State of Washington for the purpose of safe watercraft moorage.

Use of this RGP: The permittee is responsible for ensuring that the authorized work complies with all applicable provisions of RGP 1, including any project-specific special conditions that may be added by the District Engineer. Failure to abide by the requirements of this RGP may constitute a violation of the Clean Water Act and/or Rivers and Harbors Act. For purposes of this RGP, the term "permittee" shall include all successors in interest.

RGP 1 contains provisions intended to protect the environment and endangered species. Work that will not comply with these provisions is not authorized by this RGP and may require Department of the Army authorization by standard individual permit. Moreover, compliance with the provisions of RGP 1 does not itself guarantee that the work is authorized by this RGP. Activities that appear to comply with the provisions of this RGP but would have an unacceptable adverse impact on the public interest are not authorized.

Activities authorized by this RGP: Work authorized by RGP 1 is limited to the activities described below. Activities authorized include the installation, maintenance, repair, replacement, and retention of noncommercial watercraft lifts at existing residential waterfront structures (e.g., pier, float, ramp,

bulkhead, buoy, etc). Watercraft lifts includes but is not limited to lifts for motorized boats, kayaks, canoes, jet skis, and float planes. This RGP does not authorize watercraft lifts or canopies at commercial marinas. The applicant must, to the maximum extent practicable, orient the watercraft lift and canopy (lengthwise) in a north-south direction to minimize shading impacts. Definitions, descriptions, and/or examples of terms used in this RGP are located in Appendix E of this document.

Categories of Activities:

Category A: Installation or retention of one ground-based or floating watercraft lift without a canopy, per adjacent upland property, where no other watercraft exists. If watercraft lifts are proposed to be installed at a joint-use pier owned by two upland property owners, under this Category, only one can be installed.

Category B: Installation, repair, maintenance, replacement or retention of one watercraft lift, without a canopy, and the placement of no more than 2 cubic yards of fill to anchor the lift. "Fill" only includes the placement of rock or pre-cast concrete blocks. Fill does not mean installation of piling.

1. Fill can only be used if the substrate prevents the use of anchoring devices which can be embedded into the substrate (e.g., compacted substrate portions of Lake Chelan).

2. The fill must be clean.

3. The fill must consist of rock or pre-cast concrete blocks.

4. The fill must only be used to anchor the watercraft lift.

5. The minimum amount of fill must be utilized to anchor the watercraft lift.

6. To the maximum extent possible, work must be performed in the dry.

Category C: Installation or retention of additional watercraft lifts beyond one, without a canopy, at a single residential use waterfront structure. A maximum of 3 lifts are allowed at a single residential use overwater structure. However, only two lifts can be ground-based, all other lift(s) must be floating or suspended lift(s).

Category D: Installation or retention of additional watercraft lifts beyond one, without a canopy, at a joint use waterfront structure. There is no limitation to the maximum amount of watercraft lifts at an existing joint use structure. However, different project impact reduction and mitigation measures will be required based on the type of additional lifts (e.g., floating or suspended versus ground-based).

Category E: Installation or retention of a translucent canopy on a new or existing watercraft lift.

1. In fresh waters, the canopy and structure should be located waterward of the 9-foot depth elevation (based on OHW or MHHW). If this condition cannot be met, additional project impact reduction measures are required.

2. The lowest edge of the canopy must be at least 8 feet above the plane of OHW or MHHW.

3. Only 1 (one) canopy can be installed per single or joint use residential overwater structure.

4. The watercraft lift with the canopy must be oriented with the length in the north-south direction to the maximum extent practicable.

Category F: Replacement, repair or maintenance of existing watercraft lifts. This includes parts which are located above or below the plane of ordinary high water (OHW) or mean high water (MHW) including parts which make contact with the substrate of the waterbody. If a watercraft lift is being replaced, it must be replaced in the same footprint as the original one or in a location at the same water depth or deeper on the same property.

Pile Driving Requirements: If a drop hammer pile driver for steel piling is utilized, a sound attenuation device or system must be implemented during pile driving. The diameter of steel piling cannot exceed 12 inches.

1. For piling with a diameter of 10 inches or less, the sound attenuation device must include one of the following: the placement of a block of wood (minimum of 6 inches thick) between the hammer and the piling during pile driving or use a bubble curtain that distributes air bubbles around 100% of the perimeter of the piling over the full depth of the water column or any other Corps approved sound attenuation device. Information on bubble curtain design is available on the Corps' website at www.nws.usace.army.mil/reg.html.

2. For piling with a diameter greater than 10 inches, up to 12 inches, the sound attenuation device must include both the placement of a block of wood (minimum of 6 inches thick) between the hammer and the piling during pile driving **and** use a bubble curtain that distributes air bubbles around 100% of the perimeter of the piling over the full depth of the water column or any other Corps approved sound attenuation device.

Work Windows: To minimize impacts to fish species and bald eagles, work is restricted to certain time periods. There are different work window restrictions for fish species and bald eagles. For projects with work windows for both fish and bald eagles, construction can only occur during the times where the windows overlap.

Fish species timing and equipment restrictions:

1. For activities not contacting the substrate (e.g., repair of above substrate portions of the lift, installation of a canopy, or installation of floating or suspended watercraft lifts) or work performed in the dry, there are no work window restrictions. Work can occur at any time.

2. For activities contacting the substrate (e.g., installation of a ground-based watercraft lift) refer to current allowable work windows located on the Corps' website at www.nws.usace.army.mil click on Regulatory – Regulatory Permits --Endangered Species Act -- Allowable Work Windows.

Bald eagle timing and equipment restrictions:

1. For activities only requiring the use of hand or powered hand tools, there are no work window restrictions. Work can occur at any time.

2. For activities requiring the use of equipment **beyond hand or powered hand tools**, refer to current allowable work windows located on the Corps' website at www.nws.usace.army.mil click on Regulatory – Regulatory Permits --Endangered Species Act -- Allowable Work Windows.

Location of Authorized Activities: RGP 1 is applicable in all waters of the United States, including navigable waters of the United States, within the State of Washington except: in the main stem of the Snake River and the Pend Oreille River. On the main stem of the Columbia River above Priest Rapids

Dam, only activities meeting Category A and F can be authorized by this RGP. All other categories of this RGP cannot be authorized by this RGP in the Columbia River above Priest Rapids Dam.

Application Procedure: The application procedure varies based on the category of work (Categories A – F described above). All categories require submittal of drawings in the format described in Appendix D. Any applicant proposing work in any of the categories requiring pile driving, must submit an application and receive approval **before** any work in waters of the U.S. can commence. Any applicant proposing work in any of the categories except Category F, closer than 30 feet from the OHW mark or MHW mark on the shoreline, must submit an application and receive approval **before** any work in waters of the U.S. can commence.

Categories A, B and F: Appendix A must be completed and submitted **before or within 30 days after** the work is completed. Work may only commence within the approved work windows.

Exception: For work proposed under Category B in the Lake Washington and Lake Sammamish system which includes but is not limited to Lake Washington, Lake Sammamish, Lake Union, and the Lake Washington Ship Canal, the applicant must obtain permit approval before any work commences. Individual consultation must be completed before the work can be authorized under this RGP for Category B work in the Lake Washington and Lake Sammamish system. The applicant may submit Appendix A as their permit application and the form will be utilized as a Reference Biological Evaluation and the Corps will initiate an individual ESA consultation.

Categories C and D: Appendix A must be submitted **before** the work can commence. Written approval must be obtained from the Corps before any work can commence for these activities.

Categories E: Appendix A must be submitted to the Corps **before** the work can commence. Written approval must be obtained from the Corps before any work can commence for this category of work.

For work in the Lake Washington and Lake Sammamish system that includes but is not limited to Lake Washington, Lake Sammamish, Lake Union, and the Lake Washington Ship Canal, the applicant may submit Appendix A as their permit application but the form will be utilized as a Reference Biological Evaluation and the Corps will initiate an individual ESA consultation. Individual consultation must be completed before the work can be authorized under this RGP for this category of work in the Lake Washington and Sammamish system.

Project Impact Reduction and Conservation Measures: *While the individual activities described above will have minimal impacts to the aquatic environment, direct, indirect, and cumulative impacts from these structures have not been fully avoided.*

Salmonids, including juvenile chinook salmon and sub-adult and adult bull trout use the nearshore areas of Puget Sound for feeding, rearing, and/or as a migratory corridor. As small individuals, they stay in shallow waters to avoid large fish predators found in deeper water, and to rear and feed.

The watercraft lift structure itself and canopy inhibits light from entering the water. This loss of light reduces the ability of aquatic vegetation to grow. This subsequently has an impact on the feeding and rearing habitat of fish. Also, the shadow created by the structures may provide cover for predators of salmonid fish species. Therefore, the amount of shade created by these structures needs to be minimized. Also, because the shallow water habitat is an important habitat feature, structures should be placed in deeper water to minimize impacts to the shallow water habitat.

The purpose of these measures is to offset losses to the aquatic environment resulting from direct, indirect, and cumulative impacts of watercraft lifts and canopies. These mitigation measures will restore or create important fish habitat to offset the impact of the project.

The number of "Mitigation Points" required is dependent upon the category of work, water depths, and aquatic habitats at the project site.

Table 1 lists the required number of mitigation points for different categories of work located at different water depths, located in different aquatic habitats at the project site.

Table 1. Number of Required Mitigation Points for Certain Categories, Water Depths and Habitats

Project Work Description	Location of Proposed Work	
	A	B
	Landward most side of the watercraft lift is in or over a water **depth of 9 feet or greater** (based on OHW or MHHW)	Landward most side of the watercraft lift is in or over a water depth **less** than 9 feet (based on OHW or MHHW)
	# Required Mitigation Points	# Required Mitigation Points
Category A or B or F	0	0
Category C or D For <u>each</u> **floating** or **suspended** watercraft lift installed beyond one	2	4
Category C or D For <u>each</u> **ground based** watercraft lift installed beyond one	4	6
Category E (mitigation points for this category is <u>added</u> to any of the other applicable categories) For a translucent canopy.	0	2

Table 2 is a list of different types of project impact reduction measures the applicant can select from to mitigate for the proposed watercraft lift(s) and/or translucent canopy. Each project impact reduction measure is given a point value. Based on the size of the project, a certain number of mitigation points will be required to mitigate for the impacts. Table 2 describes the method to be used to determine how many mitigation points are required for the proposed project. Mitigation work should be accomplished onsite if possible. If mitigation work cannot be completed onsite, the mitigation work may occur at a Corps' approved offsite location.

Note: Fractional numbers 0.5 or above are rounded up and fractional numbers below 0.5 are rounded down. Examples: The number 7.3 would be rounded down to 7. The number 6.5 would be rounded up to 7.

Table 2. Project Impact Reduction and Mitigation Measure Options and Corresponding Mitigation Points
(Note: The term "remove" means remove from the area waterward of MHHW or OHW and dispose of, or place in, an appropriate upland or approved disposal area.)

Mitigation Measure Option #	Number of Mitigation Points	Project Impact Reduction and Mitigation Measure Description
1	2	Plant 1 tree and 1 shrub (from the planting list and per planting specifications in this RGP) within 15 feet landward of MHHW or OHW and parallel to the shoreline
2	2	Remove 1 pile (if the pile is treated wood, use MMO#4 instead)
3	2	Permanently prevent an existing permitted float, which currently grounds out, from resting on the tidal substrate (at least 1 foot above the tidal substrate)
4	2	Remove 1 treated wood pile located waterward of MHHW or OHW Guidance on disposal and disposal location of treat wood materisl is located at www.ecy.wa.gov/programs/hwtr/demodebris/pages2/demowood.html
5	2	Remove 9 square feet of an existing overwater structure. This includes the permanent removal of a covered moorage, opaque watercraft lift canopies, and skirting.
6	2	Permanently prevent an existing anchor line from scouring the tidal substrate
7	6	Remove 3 linear feet of hardened shoreline and plant removal area with native vegetation (see Table 3)
8	1	Remove manmade debris (e.g., concrete rubble, tires, etc.) covering 9 square feet This option will require before and after photos of debris removal and removal area, a description of the type of debris and a vicinity map showing the location of the debris and removal area.
9	Varies	Removal of an entire or portion of an existing groin, The number of mitigation points varies depending on the size of the groin. Three mitigation point = 9 square feet (footprint) of groin removed. This option will require before and after photos of the groin and removal area and a vicinity map showing the location of the groin. For example: The groin to be removed is 9 feet long and 3 feet wide. This structure has a footprint of 27 square feet. 27 divided by 3 equals 9 mitigation points.
10	Varies	Removal of an entire or portion of an existing boat ramp, The number of mitigation points varies depending on the size of the boat ramp. Three mitigation point = 9 square feet (footprint) of boat ramp removed. This option will require before and after photos of the boat ramp and

Mitigation Measure Option #	Number of Mitigation Points	Project Impact Reduction and Mitigation Measure Description
		removal area and a vicinity map showing the location of the boat ramp. For example: The boat ramp to be removed is 12 feet long and 8 feet wide. This structure has a footprint of 96 square feet. 96 divided by 9 = 10.7 times 3 equals 32 mitigation points.
11	Varies	Removal of an entire or portion of an existing marine railway (two rails and support structures), in its entirety. The number of mitigation points varies depending on the length of the marine railway. One mitigation point = 2 linear feet of a pair of rails removed. Note: each rail is not counted separately. This option will require before and after photos of the marine rail and removal area and a vicinity map showing the location of the boat ramp. For example: The marine railway to be removed is 14 feet long. 14 divided by 2 = 7 mitigation points.
12	Varies	Install grating on an existing overwater structure with a solid deck surface. Three mitigation point = 9 square feet of installed grating For example: A boatlift will be installed adjacent to a pier which has the surface area completely decked with wood, no open surface area. The decking is removed from an area 6- by 3-feet and grating is installed for a total area of 18 square feet. 18 divided by 9 sq. ft. equals 2 times 3 → 6 mitigation points.

Grating: The grating must have at least 60 percent open area. The grating must be oriented to maximize the amount of light passage. To ensure that light transmission is not impeded, grating must not be covered or blocked underneath with any objects, such as, but not limited to, buildings, planters, storage sheds or boxes, nets, carpets, boards, tables, lawn furniture, and utility conduits or boxes.

Note: No "credit" is given for constructed mitigation points exceeding the required amount of required mitigation points.

Mitigation Planting Requirements. *The purpose of mitigation planting is to offset losses to the aquatic environment resulting from the installation of an overwater structure. The mitigation planting establishes a plant community and associated food web that can be utilized by foraging and migrating salmonids as they pass through the project area and in tidal systems, provides complex shade for upper intertidal spawning forage fish.*

To this end, the prospective permittee is required to establish and preserve the planting plot(s) at the project site for the duration that the watercraft lift and/or canopy is in place. A drawing of the proposed planting area must be recorded with the Registrar of Deeds per General Condition 26 of this RGP.

The planting plot(s) will be planted (cuttings, burlapped roots or 1 – 5 gallon pots) with native shrubs and trees. The plot needs to be on the property but does not need to be located adjacent to the overwater structures and/or watercraft lift. The plantings must be located within 15 feet landward of MHHW or OHW, planted in an alignment nearest to the water parallel to the shoreline. The shrubs will be planted at intervals of 3-feet on center, and the trees will be planted at intervals of 10-feet on center. The Corps must approve a planting plan submitted by the prospective permittee prior to issuance of an RGP to the permittee. The plant species must be from the plant list in Table 3, or must be a species approved by the Corps.

EXAMPLE OF A PLANTING PLAN:

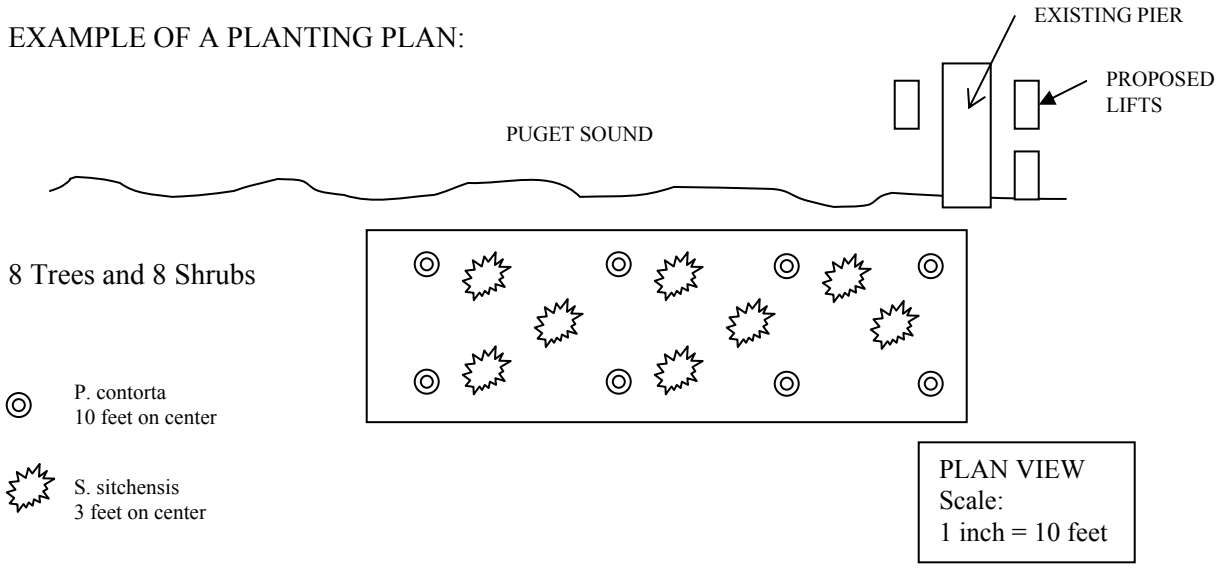


Table 3. List of Approved Plant Species

Common Name	**Scientific Name**
Shrubs:	
Sitka willow	*Salix sitchensis*
Souler willow	*S. scouleriana*
Sandbar willow	*S. exigua*
Pacific willow	*S. lasiandra*
Hooker willow	*S. hookeriana*
Red osier dogwood	*Cornus stolonifera*
Red flowering currant	*Ribes sanguineum*
Nootka rose	*Rosa nutkana*
Baldhip rose	*Rosa gymnocarpa*
Thimbleberry	*Rubus parviflorus*
Red elderberry	*Sambucus racemosa*
Snowberry	*Symphoricarpos albus*
Vine maple	*Acer circinatum*
Western serviceberry	*Amelanchier alnifolia*
Ocean spray	*Holodiscus discolor*
Hazelnut	*Corylus americana*
Sweet gale	*Myrica gale*
Tall Oregon grape	*Mahonia aquifolium*
Dull Oregon grape	*M. nervosa*
Trees:	
Black cottonwood	*Populus trichocarpa*
Douglas fir	*Pseudotsuga menzeisii*
Sitka spruce	*Picea sitchensis*
Shore pine	*Pinus contorta*
Ponderosa pine	*Pinus ponderosa*
Cascara	*Rhamnus purshiana*
Big leaf maple	*Acer macrophyllum*
Red alder	*Alnus rubra*
Birch species	*Betula spp.*
Pacific dogwood	*Cornus nuttalii*
Choke cherry	*Prunus virginiana*

Mitigation Planting Performance Standards. One hundred percent survival of all planted trees and shrubs is required during the first and second years after planting the plot(s). During the third through fifth years after planting, 80 percent survival is required. The permittee must protect the planting plot(s) against predation—the Corps recommends fencing. Individual plants that die must be replaced with native shrubs and trees taken from the species list above. Maintenance of the mitigation area includes removal and replacement of dead or dying plants and removal of invasive and/or noxious weeds. Maintenance does not include trimming or mowing of the plants. The plants must be allowed to develop naturally. If

during the 5 years of monitoring, contingency plans are required (e.g., additional plantings, planting different species), the permittee must implement any Corps required contingency plans.

Mitigation Reports. Mitigation reports must be submitted to the Corps for all projects where mitigation is required.

a. Mitigation must be completed within one year of permit issuance. A report on mitigation completion, including as-built drawings, must be submitted to the Corps 12 months from the date the Corps issues an RGP to the permittee. The permittee can meet this reporting requirement by submitting to the Corps a completed *Report for Mitigation Work Completion*, Appendix B.

b. **If plantings are implemented:** Mitigation planting monitoring reports will be due annually, no later than November 30 of each monitoring year, for 5 years from when Corps accepts the as-built drawings. The mitigation monitoring report will include written and photographic documentation on tree and shrub mortality and replanting efforts. Photographs must be taken between June – August (the best time of year to show plant growth). Photographs must show a panoramic view of the entire mitigation planting area. A set point from where photos are taken must be established and used repeatedly for each monitoring year. The date of the photos must be noted on the monitoring report. The permittee can meet this reporting requirement by submitting to the Corps a completed *Mitigation Planting Monitoring Report*, Appendix C.

Water Quality Certification: The Corps requested that the Washington Department of Ecology (Ecology) pursuant to Section 401 of the CWA and Chapters 173 - 225 of the Washington Administrative Code (WAC), and the Environmental Protection Agency, and Puyallup and Chehalis Tribes pursuant to Section 401 of the CWA, certify that those activities authorized by Category C of this RGP for which these agencies are responsible, will not violate established State water quality standards. All of these agencies waived the requirement of a water quality certification for activities described in this RGP.

Coastal Zone Management Consistency: The Corps requested that the Washington Department of Ecology pursuant to the requirements of the U.S. Coastal Zone Management Act (16 U.S.C. 1452 et seq.) and its implementing regulations (15 CFR 923-930) concur that the activities authorized by this RGP will be consistent with the requirements of the State of Washington's CZM program. Ecology waived the requirement for coastal zone management consistency for activities described in this RGP.

Endangered Species: The Endangered Species Act (ESA) of 1973, as amended, requires all Federal agencies to consult with the National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service (FWS), pursuant to Section 7 of the ESA, on any action, or proposed action, permitted, funded, or undertaken by the agency that may affect a species listed as threatened or endangered under the ESA, or its designated critical habitat. Informal consultation was initiated for all activities described in this RGP except Categories B and E in the Lake Sammamish and the Lake Washington System. Concurrence was received from both agencies. Work in Categories B and E in the Lake Sammamish and the Lake Washington System require individual ESA consultation separate from the programmatic consultation for the RGP.

Essential Fish Habitat: The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, requires all Federal agencies to consult with the NMFS on all actions, or proposed actions, permitted, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH). This RGP will not adversely affect EFH for federally managed fisheries in Washington waters. No further consultation is required.

Permit Conditions: Department of the Army authorization under this RGP is subject to the following special and general conditions:

SPECIAL CONDITIONS

1. The permittee must put the Department of the Army (DA) permit reference name and number on the authorized watercraft lifts. The name and number must be written such that the marking is permanent, is located above the water surface, and can be clearly seen. The Corps will provide the DA reference name and number to the permittee.

2. No work may be performed over or within 50 feet of eelgrass and macroalgae beds.

3. No work may be performed in or within 50 feet of Washington State documented spawning habitat for listed or proposed forage fish species. Contact the Washington State Department of Fish and Wildlife for a determination.

4. During the installation and utilization of the watercraft lift(s) no large woody debris may be removed from the aquatic habitat.

5. All structural steel members must be pre-painted and dried prior to installation.

6. If watercraft lifts include wood, only non-treated wood shall be used in fresh waters. In tidal waters, no creosote, pentachlorophenol, CCA, or comparably toxic compounds not approved for marine use, shall be used for any portion of the overwater structure. For any ACZA treated wood, the wood must be treated by the manufacturer per the Post Treatment Procedures outlined in "BMP Amendment #1 - Amendment to the Best Management Practices (BMPs) for the Use of Treated Wood in Aquatic Environments; USA Version - Revised July 1996", by the Western Wood Preservers Institute, as amended April 17, 2002 or the most current BMPs. This information is available on the internet at www.WWPInstitute.org. Third party certification that the material was produced according to these BMPs must be provided to the Corps before authorized work can commence.

7. Only two new piles may be driven and only if necessary for watercraft lift installation.

8. If a barge is used, the barge must not ground out and the barge must not be located over or adjacent to vegetated shallows (except where such vegetation is limited to Washington State designed noxious weeds).

9. Existing watercraft lifts to be removed must be removed in their entirety.

10. If a floating watercraft lift is installed, it must not rest on the substrate at any time.

11. Work that disturbs the substrate, bank, or shore of a water of the United States shall occur in the dry whenever practicable.

12. Equipment shall be operated from an out-of-water location whenever possible. Equipment shall be operated in a manner that minimizes the suspension of particulates. All equipment used in or around waters shall be clean and inspected daily prior to use to ensure that the equipment has no fluid leaks. Should a leak develop during use, the leaking equipment shall be removed from the

site immediately and not used again until it has been adequately repaired. No equipment may be stored or fueled so close to a surface water that the activity could adversely affect the waterbody.

GENERAL CONDITIONS

1. Reliance on Permittee's Information. In verifying a permittee's authorization under this RGP, the Department of the Army has relied, in part, on the information provided by the permittee. If this information proves to be false, incomplete, or inaccurate, the permittee's authorization may be modified, suspended, or revoked, in whole or in part.

2. Compliance with Terms and Conditions. Projects authorized by this RGP shall comply with all terms and conditions herein. Failure to abide by these terms and conditions invalidates this authorization and may result in a violation of Federal law, which may require that the permittee restore the site or take other remedial action. Activities requiring Department of the Army authorization that are not specifically authorized by this RGP are prohibited unless authorized by another Department of the Army permit.

3. Contractor's Copy of Permit. The permittee shall provide complete copies of this permit and the Corps' verification letter (if appropriate) for the authorized project to each contractor involved in the project and keep copies of this permit and Corps' verification letter available for inspection at the project site.

4. Access for Inspection. The permittee shall allow the District Engineer or his authorized representative to inspect the project whenever deemed necessary to ensure that the activity is in compliance with the terms and conditions prescribed herein.

5. Limits of Authorization. This permit does *not*:

    a. Obviate the requirement to obtain all local, State, or other Federal authorizations required by law for the activity authorized herein, including any authorization required from Congress.

    b. Convey any property rights, either in real estate or material, or any exclusive privileges.

    c. Authorize any injury to property, invasion of rights, or any infringement of local, State, or Federal laws or regulations.

    d. Authorize the interference with any existing or proposed Federal project.

6. Limits of Federal Liability. This permit is not an approval of the design features of any authorized project or an implication that such project is adequate for the intended purpose; a Department of the Army permit merely expresses the consent of the Federal Government to conduct the proposed work insofar as public rights are concerned. In issuing this RGP, the Federal Government does not assume any liability for the following:

    a. Design or construction deficiencies associated with the authorized work.

    b. Damages to the permitted project or uses thereof as a result of other permitted activities or from natural causes, such as flooding.

c. Damages to persons, property, or to other permitted or unauthorized activities or structures caused by the activity authorized by this permit.

d. Damages associated with any future modification, suspension, or revocation of this permit.

e. The removal, relocation, or alteration of any structure or work in navigable waters of the United States ordered by the Secretary of the Army or his authorized representative.

f. Damage to the permitted project or uses thereof as a result of current or future activities undertaken by, or on behalf of, the United States in the public interest.

7. Tribal Rights. No activity may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

8. Obstruction of Navigation. Permittees understand and agree that, if future operations by the United States require the removal, relocation, or other alteration of the work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work unreasonably obstructs the full and free use of navigable waters of the United States, the permittee shall, upon due notice from the Corps, remove, relocate, or alter the obstructions caused thereby, without expense to the United States. If the permittee fails to comply with the direction of the Corps, the District Engineer may restore the navigable capacity of the waterway, by contract or otherwise, and recover the cost thereof from the permittee.

9. Stability. Permittees shall design projects to be stable against the forces of flowing water, wave action, and the wake of passing vessels.

10. Maintenance. Permittees shall properly maintain all authorized structures and fills, including maintenance necessary to ensure public safety.

11. Marking Structures. Permittees shall install and maintain any lights, signals, or other appropriate markers necessary to clearly designate the location of structures or work that might pose a hazard to public safety. Permittees shall abide by U.S. Coast Guard requirements concerning the marking of structures and work in navigable waters of the United States.

12. Endangered Species. This RGP does not authorize any activity that is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation or any listed or proposed critical habitat, as identified under the ESA.

13. Historic Properties. This RGP does not authorize any activity that may affect historic properties listed, or eligible for listing, in the National Register of Historic Places (NRHP) until the provisions of 33 CFR 325, Appendix C, have been satisfied. Historic properties include prehistoric and historic archeological sites, and areas or structures of cultural interest. A prospective permittee must notify the District Engineer if the proposed activity may affect an historic property that is listed, eligible for listing, or may be eligible for listing in the NRHP, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. If a previously unknown historic property is encountered during work authorized by this RGP, the permittee shall immediately cease all ground activities in the immediate area, notify the Corps within 1 business day of discovery. The permittee shall perform any work required by the Corps in accordance with Section 106 of the National Historic Preservation Act and Corps regulations

and avoid any further impact to the property until the District Engineer verifies that the requirements of 33 CFR Part 325, Appendix C, have been satisfied.

14. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status unless the appropriate Federal agency (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service), with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

15. Water Quality Standards. All activities authorized herein that involve a discharge of dredged or fill material into waters of the United States shall, at all times, remain consistent with all applicable water quality standards, effluent limitations and standards of performance, prohibitions, pretreatment standards, and management practices established pursuant to the Clean Water Act (P.L. 92-500; 86 Stat. 816) or pursuant to applicable State and local law.

16. Minimization of Environmental Impact. Permittees shall make every reasonable effort to conduct the authorized activities in a manner that minimizes the adverse impact of the work on water quality, fish and wildlife, and the natural environment, including adverse impacts to migratory waterfowl breeding areas, spawning areas, shellfish beds, and aquatic resource buffer zones.

17. Soil Erosion and Sediment Controls. Permittees shall use and maintain appropriate erosion and sediment controls in effective operating condition and permanently stabilize all exposed soil and other fills, including any work below the ordinary high water mark or high tide line, at the earliest practicable date using native vegetation to the maximum extent practicable. The permittee shall remove all installed controls as soon as they are no longer needed to control erosion or sediment.

18. Equipment. Permittees shall place heavy equipment working in wetlands on mats, or take other appropriate measures to minimize soil disturbance.

19. Aquatic Life Movements. Permittees shall not substantially disrupt the necessary life-cycle movement of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the primary purpose of the activity is to temporarily impound water.

20. Management of Water Flows. To the maximum extent practicable, the activity must be designed to maintain downstream flow conditions. Furthermore, the activity shall not permanently restrict or impede the passage of normal or expected high flows unless the primary purpose of the fill is to temporarily impound water. Permittees should limit the work conducted in waters of the United States to low- or no-flow periods.

21. Water Supply Intakes. Permittees shall ensure that activities authorized by this RGP have no more than a minimal adverse impact on public water supply intakes.

22. Practicable Alternatives. Activities authorized by this RGP shall be designed and constructed to avoid and minimize adverse impacts to waters of the United States to the extent practicable through the use of practicable alternatives. Alternatives that shall be considered include those that minimize the number and extent of discharges of dredged or fill material into waters of the United States.

23. Suitable Material. Any material or structure placed in waters of the United States, whether temporary or permanent, shall be free of toxic pollutants in toxic amounts.

24. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected area returned to pre-construction contours.

25. Disposal of Excess Material. All construction debris and any other material not authorized by the Corps for permanent placement into waters of the United States shall be disposed of in an upland location in a manner that precludes it from entering waters of the United States.

26. Deed Restriction: For projects with mitigation, a copy of this permit, permit drawings, mitigation planting plan (if applicable), and final authorization letter shall be recorded with the Registrar of Deeds, within 60 days after final Corps authorization, to ensure that subsequent property owners are aware of the installation, use, and mitigation requirements. Proof of this must be provided to the Corps within 65 days after the date of the Corps' RGP verification letter to the permittee.

Modification, suspension, or revocation of the RGP: This RGP may be modified or suspended in whole or in part if the Secretary of the Army or his authorized representative determines that the individual or cumulative impacts of work that would be authorized using this procedure are contrary to the public interest. Any such modification, suspension, or revocation shall become effective 30 days after the issuance of a public notice announcing such action. The final decision whether to modify, suspend, or revoke this permit, in whole or in part, shall be made pursuant to procedures prescribed by the Chief of Engineers. Following such revocation, any future activities heretofore authorized by this RGP will require alternate Department of the Army authorization.

The authorization of an individual project under this RGP may also be summarily modified, suspended, or revoked, in whole or in part, if the permittee either fails to abide by the terms and conditions of this permit or provides information that proves to be false, incomplete, or inaccurate, or upon a finding by the District Engineer that such action would be in the public interest. If a permittee's authorization is revoked, the permittee shall, upon notice of such revocation, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the waterway to its former condition. If the permittee fails to comply with the direction of the Secretary of the Army or his authorized representative, the Secretary or his designee may restore the waterway to its former condition, by contract or otherwise, and recover the cost thereof from the permittee.

Expiration of the RGP: This permit shall become effective on the date of the signature of the District Engineer or his authorized representative and will automatically expire 5 years from that date unless the permit is modified, revoked, or extended prior to that date. Activities that have commenced (e.g., are under construction) or are under contract to commence in reliance upon this permit will remain authorized provided that the activity is completed within 1 year of the date of this permit's expiration, modification, or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:

14 February 2005, Rev. 29 January 2007

Date

Michelle Walker

MICHAEL MCCORMICK
Colonel, Corps of Engineers
District Engineer

APPENDIX A
Application Form
For RGP 1, Watercraft Lifts

Version: January 29, 2007

Please fully complete this form and attach vicinity, plan and elevation drawings and any other relevant information. Submit the information to: U.S. Army Corps of Engineers, Regulatory Branch, P.O. Box 3755, Seattle, Washington 98124-3755.

This application is for watercraft lifts and canopies in certain fresh and marine/estuarine waters within the State of Washington for the purpose of safe watercraft moorage. You may use this application whether or not your project meets all requirements of Regional General Permit 1 (RGP 1). However, projects not meeting all requirements or for Category B and E in the Lake Washington and Sammamish system, must undergo Section 7 Endangered Species Act (ESA) consultation with the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). Section 7 ESA consultation may involve a more conservative design or additional mitigation. Therefore, projects not meeting all requirements should provide a greater amount of mitigation than is required by RGP 1 in order to offset impacts to the aquatic environment.

Eligibility for RGP
a. Corps reference number: _____ [To be completed by the Corps] b. This application: ☐ Meets all of the requirements of RGP 1. ☐ Does not meet all of the requirements of RGP 1. This form constitutes an application for an individual permit and a reference biological evaluation in association with NMFS reference: 2003/01572 USFWS reference: I-3-05-PI-0032

1. Permittee name, address, and telephone number:

   Single or Joint Use (adjacent waterfront structure): _____ If joint use, you must list the other waterfront property owners: name, address, and telephone number, as co-applicants.

2. Authorized agent's name, address, and telephone number:

3. Contractor name, address, telephone number, and point of contact:

4. Specific location of project area:

Name of Waterway _____
Street Address _____
Section _____Township _____ Range _____
Latitude _____ Longitude _____
City/County _____, Washington State
Adjacent Property Owners (names and addresses)

5. Description of the proposed work and drawings (attach drawings on 8 ½- by 11-inch sheets, including a vicinity map, a plan view, and an elevation view; the drawings must include information as detailed on Appendix E – Drawing Checklist). The drawings must clearly show the factors detailed in the project description section of this RGP. The work is proposed under Category _____ of RGP 1.

6. Description of the Single or Joint Use Overwater Structure adjacent to proposed activity:

7. Number of existing watercraft lifts and/or canopy(ies) at the existing overwater structure: ground-based lifts _____ floating lifts _____ suspended lifts _____ canopies _____

8. Number of the previously identified (item 8) existing lifts to be replaced, maintained, or repaired: ground-based lifts _____ floating lifts _____ suspended lifts _____ canopies _____

9. Number of brand new: ground-based lifts _____ floating lifts _____ suspended lifts _____ canopies _____

10. Depth of landward most end of proposed watercraft lift(s) and/or canopy(ies) _____ feet

11. Pile driving: Y/N _____ ; If yes, number of: _____ wood piling _____ steel piling; If using an impact hammer for steel piling, list sound attenuation device(s): _____

12. In marine waters: Eelgrass survey performed: preliminary _____ intermediate _____; attach findings

13. In marine waters: Forage fish habitat? Y/N _____; attach documentation

14. Required Mitigation Points (MP): _____ (show calculations); location of mitigation site onsite/offsite _____; Mitigation Measure Option(s) # _____; Description of proposed mitigation activity: _____

15. Work Window:
Work will be performed in the dry: ☐ Yes ☐ No
Work will contact substrate: ☐ Yes ☐ No
Distance to bald eagle nest: _____
Type(s) of equipment utilized for watercraft installation: _____

Date Work Completed: _____ (if application is submitted after completion of work)

Endangered Species Act (ESA) Information: Special Project Information

In order to meet all ESA requirements for authorization under this Regional General Permit (RGP), all applicable Requirements summarized below must be implemented. Check each item that you agree to implement. Check each item "not applicable" if they do not apply to your project. For example, if your project is in freshwater, check "not applicable" next to the Requirement 5 regarding eelgrass and macroalgae beds.

Will Implement	Will Not Implement	Not Applicable	Requirements
☐	☐	☐	1. The proposed work is within the limitations of Category A – F types of work authorized by RGP 1.
☐	☐	☐	2. Pile Driving Requirements: If a drop hammer pile driver for steel piling is utilized, a sound attenuation device or system must be implemented during pile driving. The diameter of any steel piling cannot exceed 12 inches.
☐	☐	☐	3. The required fish work window will be met.
☐	☐	☐	4. The required bald eagle work window will be met.
☐	☐	☐	5. The appropriate amount of project impact reduction and mitigation measures will be implemented.
☐	☐	☐	6. Mitigation must be completed within one year of permit issuance. A report on mitigation completion, including as-built drawings, must be submitted to the Corps 12 months from the date the Corps issues an RGP to the permittee.
☐	☐	☐	7. For projects with mitigation, a copy of this permit, permit drawings, mitigation planting plan (if applicable), and final authorization letter shall be recorded with the Registrar of Deeds, within 60 days after final Corps authorization, to ensure that subsequent property owners are aware of the installation, use, and mitigation requirements. Proof of this must be provided to the Corps within 65 days after the date of the Corps' RGP verification letter to the permittee (General Condition 26).
☐	☐	☐	8. Mitigation planting monitoring reports will be due annually, no later than November 30 of each monitoring year, for 5 years from when Corps accepts the as-built drawings.
☐	☐	☐	9. The permittee must put the Department of the Army (DA) permit reference name and number on the authorized watercraft lifts. The name and number must be written such that the marking is permanent, is located above the water surface, and can be clearly seen. The Corps will provide the DA reference name and number to the permittee (Special Condition 1).
☐	☐	☐	10. No work may be performed over or within 50 feet of eelgrass and macroalgae beds (Special Condition 2).
☐	☐	☐	11. No work may be performed in or within 50 feet of Washington State documented spawning habitat for listed or proposed forage fish species (Special Condition 3).
☐	☐	☐	12. During the installation and utilization of the watercraft lift(s) no large woody debris is removed (Special Condition 4).

Will Implement	Will Not Implement	Not Applicable	Requirements
☐	☐	☐	9. All structural steel members are pre-painted and dried prior to installation (Special Condition 5).
☐	☐	☐	10. If watercraft lifts include wood, only non-treated wood shall be used in fresh waters. In tidal waters, no creosote, pentachlorophenol, CCA, or comparably toxic compounds not approved for marine use, shall be used for any portion of the overwater structure. For any ACZA treated wood, the wood must be treated by the manufacturer per the Post Treatment Procedures outlined in "BMP Amendment #1 - Amendment to the Best Management Practices (BMPs) for the Use of Treated Wood in Aquatic Environments; USA Version - Revised July 1996", by the Western Wood Preservers Institute, as amended April 17, 2002 or the most current BMPs. This information is available on the internet at www.WWPInstitute.org. Third party certification that the material was produced according to these BMPs must be provided to the Corps before authorized work can commence (Special Condition 6).
☐	☐	☐	11. Only two (2) new piles may be driven and only if necessary for watercraft lift installation (Special Condition 7).
☐	☐	☐	12. If a barge is used, the barge does not ground out and the barge is not over or adjacent to vegetated shallows (except where such vegetation is limited to Washington State designated noxious weeds) (Special Condition 8).
☐	☐	☐	13. Existing watercraft lifts to be removed are removed in their entirety (Special Condition 9).
☐	☐	☐	14. If a floating watercraft lift is installed, it must not rest on the substrate at any time (Special Condition 10).
☐	☐	☐	15. Work that disturbs the substrate, bank, or shore of a water of the United State shall occur in the dry whenever practicable (Special Condition 11).
☐	☐	☐	16. Equipment shall be operated from an out-of-water location whenever possible. Equipment shall be operated in a manner that minimizes the suspension of particulates. All equipment used in or around waters shall be clean and inspected daily prior to use to ensure that the equipment has no fluid leaks. Should a leak develop during use, the leaking equipment shall be removed from the site immediately and not used again until it has been adequately repaired. No equipment may be stored or fueled so close to a surface water that the activity could adversely affect the waterbody (Special Condition 12).
☐	☐	☐	17. All applicable General Conditions will be met.

I CERTIFY THAT I AM FAMILIAR WITH THE INFORMATION CONTAINED IN THIS APPLICATION, AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, SUCH INFORMATION IS TRUE, COMPLETE, AND ACCURATE. I FURTHER CERTIFY THAT I POSSESS THE AUTHORITY TO UNDERTAKE THE PROPOSED ACTIVITIES. I HEREBY GRANT TO THE AGENCIES TO WHICH THIS APPLICATION IS MADE, THE RIGHT TO ENTER THE ABOVE-DESCRIBED LOCATION TO INSPECT THE PROPOSED, IN-PROGRESS, OR COMPLETED WORK. I AGREE TO START WORK ONLY AFTER ALL NECESSARY PERMITS HAVE BEEN RECEIVED.

If the applicant has checked "Will Not Implement" for any of the above items, then the following items must be completed by the applicant:

☐ You must attach a completed Coastal Zone Management form.

Note: This form can be found on the Corps' website: www.nws.usace.army.mil/reg click on Regulatory - Regulatory/Permits – Forms.

☐ Based on the existing environmental conditions and the proposed work, the applicant is proposing additional mitigation (beyond the requirements of Table 1) as described below: _____

Signature of Applicant	Date
Signature of Authorized Agent	Date
Signature of Contractor	Date

APPENDIX B

Status Report for Mitigation Work Completion for RGP 1

Within one (1) year of the date your permit was issued, submit this completed form to: U.S. Army Corps of Engineers, Regulatory Branch, P.O. Box 3755, Seattle, WA 98124-3755. You must submit a new form annually until the Corps accepts your as-built drawings of the mitigation construction.

Corps Reference Number: _____

Date the Corps Issued Your Permit: _____

Date this Report is Due: _____

Number of Mitigation Points Required by Corps: _____

Your Name: _____

Your Address: _____

Your City/State/Zip Code: _____

Location of Mitigation: _____

You must attach to this form: ☒ As-built drawing(s) of planting areas (if installed), and
☒ Photographs of the mitigation area.

Describe mitigation activity performed: _____

_____

Date completed: _____

(If applicable) Conditions of your Corps permit require at least two trees be planted in each planting plot. The vegetation you plant must be taken from this list of native species below. Shrubs should be planted at 3-feet-on-center intervals and trees should be planted at 10-feet-on-center intervals. Be sure to protect your plantings—fencing is recommended.

Name of Species You Planted	Number Planted
Total Planted:	

Native tree list: *Populus trichocarpa, Pseudotsuga menziesii, Picea sitchensis, Pinus contorta, P. ponderosa, Rhamnus purshiana, Acer macrophyllum, Alnus rubra, Betula spp., and Cornus nuttalii*
Native shrub list: *Salix sitchensis, S. scouleriana, S. exigua, S. hookeriana, S. lasiandra, Cornus stolonifera, Ribes sanguineum, Rosa nutkana, R. gymnocarpa, Rubus parviflorus, Sambucus racemosa, Symphoricarpos albus, Acer circinatum, Amelanchier alnifolia, Holodiscus discolor, Corylus americana, Myrica gale* (Note: You can suggest other species but the Corps must approve the species before planting commences.)

APPENDIX C

Mitigation Planting Monitoring Report for RGP 1

Submit this completed form to: U.S. Army Corps of Engineers, Regulatory Branch, P.O. Box 3755, Seattle, WA 98124-3755. A completed form must be submitted 1, 2, 3, 4 and 5 years after the Corps accepts your as-built drawing of the mitigation planting area.

Corps Reference Number: _____

Date Your As-Builts Were Accepted by the Corps _____

Date This Report Is Due: _____

Number of Mitigation Points Required by the Corps: _____

Your Name: _____

Your Address: _____

Your City/State/Zip Code: _____

You must attach to this form: ☒ Photographs of the mitigation area (preferably taken during June – August).

Conditions of your Corps permit require 100% survival of all planted trees and shrubs during the first and second years after planting. During the third through fifth years after planting, 80% survival is required. Individual plants that die must be replaced with a species from the list below. You must protect your mitigation area—fencing is recommended.

Date of Inspection	Species name of Dead Plants	Number of Dead Plants	Name of Species Replanted	Number Replanted

Native tree list: *Populus trichocarpa, Pseudotsuga menziesii, Picea sitchensis, Pinus contorta, P. ponderosa, Rhamnus purshiana, Acer macrophyllum, Alnus rubra, Betula spp., and Cornus nuttalii*
Native shrub list: *Salix sitchensis, S. scouleriana, S. exigua, S. hookeriana, S. lasiandra, Cornus stolonifera, Ribes sanguineum, Rosa nutkana, R. gymnocarpa, Rubus parviflorus, Sambucus racemosa, Symphoricarpos albus, Acer circinatum, Amelanchier alnifolia, Holodiscus discolor, Corylus americana, Myrica gale* (Note: You can suggest other species but the Corps must approve the species before planting commences.)

APPENDIX D - DRAWING CHECKLIST

1. **GENERAL**
   ( ) Use clear black lettering and fewest number of sheets possible; use 8 ½- by 11-inch sheets
   ( ) State the purpose of the proposed or existing work
   ( ) List property owners and indicate number by number on plan view drawing
   ( ) Show datum used in plan and elevation drawings
   ( ) Use a graphic scale on all drawings
   ( ) Use a north arrow; prepare drawing with north being directed to the top of the page
   ( ) Label all proposed and existing work as such (e.g., Proposed Pier, Proposed Fill…)
2. **TITLE BLOCK**
   ( ) A completed title block (first example) must be on every sheet; for subsequent sheets you can use the abbreviated form (second example)

PURPOSE: DATUM: ADJACENT PROPERTY OWNERS: 1. 2.	APPLICANT 2004 LOCATION ADDRESS	PROPOSED: IN: NEAR/AT: COUNTY: STATE: WA SHEET * OF * DATE:

Reference: 2004 Applicant: Proposed: At Washington Sheet * of * Date

3. **VICINITY MAP**
   ( ) Clearly show location of project (e.g., arrow, circle, etc.)
   ( ) List latitude, longitude, section, township, and range
   ( ) Name waterways
   ( ) Show roads, streets, and/or mileage to nearest town or city limits
4. **PLAN VIEW**
   ( ) Show shorelines:
   Tidal: Show mean high water (MHW) line, mean higher high water (MHHW) line
   Lakes or streams: Show the ordinary high water (OHW) line
   ( ) Show dimensions of proposed structures/fills; distance to property lines; encroachment beyond applicable shoreline; show wetland boundaries and specific impacts to wetlands
   ( ) Indicate location, quantity, and type of fill, if any
   ( ) Show all existing structures or fills on subject and adjacent properties
   ( ) Show direction of currents such as tidal ebb and flood
   ( ) Indicate adjacent property ownership
5. **ELEVATION AND/OR SECTION VIEW**
   ( ) Show shorelines, MHW line, MHHW line, OHW line, wetland boundary
   ( ) Show original and proposed elevations, water depths, dimensions of proposed structures or fills, and pertinent vertical dimensions to top and base of structure/fill; use the same vertical and horizontal scale, if possible

APPENDIX E

Definitions, descriptions, and/or examples of Terms

"*Bank*" is the rising ground bordering the waterbody forming an edge or steep slope

"*Commercial marinas*" are marinas where anybody can purchase and/or lease the use of a slip This does not include marinas or joint use piers owned by a homeowners association. Marinas or joint use piers owned by homeowners associations allow the use of the facility by only members of typically adjacent residences in the designed homeowners group and typically include fees in the maintenance fees or cost of the home

"*Eelgrass*" is a grass-like marine flowering vascular plant (*Zostera spp.*) with dark green, long, narrow, ribbon-shaped leaves which are typically 8 – 20 inches in length.

A "*floating watercraft lift"* is any lift that does not and will not in the normal course of events contact the waterbody substrate at any time - including but not limited to low tide events.

"*Forage fish spawning habitat"* Detailed descriptions of forage fish habitat can be found at http://www.wa.gov/wdfw/fish/forage/forage.htm. Very generally, spawning habitat for the following forage fish are as follows: Pacific Herring – eelgrass and macroalgae located between 0 to -10 feet tidal elevation; Surf Smelt – substrate consisting of pea gravel or coarse sand (gravel diameter 0.005 – 0.35 of an inch) between MHHW to +7 feet tidal elevation relative to the Seattle tide gauge; Pacific Sand Lance – substrate consists of pure fine grain sand beaches between MHHW to +5 feet tidal elevation, relative to the Seattle tide gauge.

"*Groin*" is a rigid structure (constructed of rock, wood, or other durable material) built out from the shore, usually perpendicular to the shore, to protect the shore from erosion or to trap sand

A "*ground-based watercraft lift*" is any lift wherein any part of the lift attaches to, or will at any time in the future attach to, rest on, or otherwise be in contact with or be supported by the waterbody substrate.

"Hardened shoreline" includes but is not limited concrete, rock or timber bulkheads, riprap, or concrete boat ramp access.

"*Joint-use*" piers, ramps, and floats are constructed and utilized by more than one contiguous residential waterfront property owner or by a homeowner's association. This does not include commercial marinas.

"Macroalgae" includes large red, green, or brown algae and what are commonly known as seaweed or kelp. For the purposes of this RGP only, any reference to macroalgae is a reference to macroalgae *attached to a substrate*, not drift macroalgae.

"*Mean higher high water (MHHW)*" is the elevation on the shore of tidal waters reached by the plane of the average of the higher of the two daily high tides, generally averaged over a period of 19 years. This elevation has been established at set tide gauges throughout Washington State. The MHHW for these tide gauges may be obtained by checking the following website: www.nws.usace.army.mil Select Civil Works – Civil Works Home – Water Management – Tidal Datums.
"*Mean high water (MHW)*" is the elevation on the shore of tidal waters reached by the plane of the average of the lower of the two daily high tides, generally averaged over a period of 19 years. This

elevation has been established at set tide gauges throughout Washington State. The MHW for these tide gauges may be obtained by checking the following website: www.nws.usace.army.mil Select Civil Works – Civil Works Home – Water Management – Tidal Datums.

"*Offsite*" means outside the property boundaries of the waterfront property owner(s) proposing the project. For the purpose of this RGP, the property boundary in the water, unless already shown on a deed or legal description, is a straight-line extension of the property line on the land, projected waterward, and perpendicular to the shoreline.

"*Onsite*" means within the property boundaries of the waterfront property owner(s) proposing the project. For the purpose of this RGP, the property boundary in the water, unless already shown on a deed or legal description, is a straight-line extension of the property line on the land, projected waterward, and perpendicular to the shoreline.

"*Opening size*" of grating is the area enclosed between the rectangular bars and cross rods in bar grating, or the area enclosed between the bonds and strands in expanded grating.

"Ordinary high water" Line on the shore of non-tidal streams and lakes "established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas." It is the line of jurisdiction in freshwaters for the Corps of Engineers regulatory program. For tidally influenced waterbodies, OHW correlates to the line of Mean Higher High Water (MHHW).

"*Overwater structures*", for the purposes of this RGP, includes piers, ramps, floats, and their associated structures.

"*Percent open area*" is a relative measure of the degree which light can pass through grating. The manufacturer often provides this value. Otherwise, it can be calculated by dividing the opening size by the sum of the opening size and the surface area of the adjacent rectangular bars and cross rods.

"Single residential use" pier, ramp, and float constructed and utilized by only one residential waterfront property owner

"*Suspended lifts*" include floating watercraft lifts and any watercraft lift which can be affixed to the existing overwater structure with no parts contacting the substrate.

"*Translucent canopy*" is a canopy constructed of material which allows sunlight to pass through and which is translucent enough for a person to read the text of this RGP.

"*Uplands*" (for the purposes of this RGP) are areas landward of the high tide line.

"Watercraft" includes but is not limited to motorized boats, kayaks, canoes, jet skis, and float planes.

ATTACHMENT 5

Inside the Legislature

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Access Washington® Official State Government Website

WACs > Title 220 > Chapter 220-110 > Section 220-110-223

220-110-206 << 220-110-223 >> 220-110-224

WAC 220-110-223

No agency filings affecting this section since 2003

Freshwater lake bulkheads.

Bio-engineering is the preferred method of bank protection where practicable. Freshwater lake bulkhead projects shall incorporate mitigation measures as necessary to achieve no-net-loss of productive capacity of fish and shellfish habitat. The following technical provisions shall apply to freshwater bulkhead projects:

(1) The toe of the bulkhead shall be placed landward of the ordinary high water line.

(2) Rock used for the bulkhead construction shall be composed of clean, angular material of a sufficient size to prevent its being washed away by high water or wave action.

(3) Material that is waterward of the ordinary high water line shall not be utilized for backfill.

(4) Excavated or dredged material shall not be stockpiled waterward of the ordinary high water line.

(5) All trenches, depressions, or holes created within the ordinary high water line shall be backfilled prior to inundation by high water or wave action.

(6) All piling, lumber, or other materials treated with preservatives shall be sufficiently cured to minimize leaching into the water or bed. The use of wood treated with creosote or pentachlorophenol is not allowed in lakes.

[Statutory Authority: RCW 75.08.080. 94-23-058 (Order 94-160), § 220-110-223, filed 11/14/94, effective 12/15/94.]

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Official State Government Website

WACs > Title 220 > Chapter 220-110 > Section 220-110-060

220-110-050 << 220-110-060 >> 220-110-070

WAC 220-110-060 No agency filings affecting this section since 2003

Construction of freshwater docks, piers, and floats and the driving or removal of piling.

All pier, dock, float, and piling construction projects shall incorporate mitigation measures as necessary to achieve no-net-loss of productive capacity of fish and shellfish habitat. The following technical provisions shall apply to freshwater dock, pier, and float construction projects and the driving or removal of piling:

(1) Excavation for and placement of the footings and foundation shall be landward of the ordinary high water line unless the construction site is separated from state waters by use of an approved dike, cofferdam, or similar structure.

(2) Alteration or disturbance of the bank and bank vegetation shall be limited to that necessary to construct the project. All disturbed areas shall be protected from erosion, within seven days of completion of the project, using vegetation or other means. The banks shall be revegetated within one year with native or other approved woody species. Vegetative cuttings shall be planted at a maximum interval of three feet (on center), and maintained as necessary for three years to ensure eighty percent survival. Where proposed, planting densities and maintenance requirements for rooted stock will be determined on a site-specific basis. The requirement to plant woody vegetation may be waived for areas where the potential for natural revegetation is adequate, or where other engineering or safety factors preclude them.

(3) Removal of existing or temporary structures shall be accomplished so that the structure and associated material does not reenter the watercourse.

(4) All piling, lumber, or other materials treated with preservatives shall be sufficiently cured to minimize leaching into the water or bed. The use of wood treated with creosote or pentachlorophenol is not allowed in lakes.

(5) Skirting or other structures shall not be constructed around piers, docks, or floats unless specifically approved in the HPA.

(6) Floatation for the structure shall be enclosed and contained, when necessary, to prevent the breakup or loss of the floatation material into the water.

(7) All work operations shall be conducted in such a manner that causes little or no siltation to adjacent areas. If at any time, fish are observed in distress, a fish kill occurs, or water quality problems develop as a result of a pier, dock, float, or piling project, construction operations shall cease and the permittee or authorized agent shall immediately contact the department.

(8) Removal of aquatic vegetation shall be limited to that necessary to gain access to construct the project.

[Statutory Authority: RCW 75.08.080. 94-23-058 (Order 94-160), § 220-110-060, filed 11/14/94, effective 12/15/94; 87-15-086 (Order 87-48), § 220-110-060, filed 7/20/87. Statutory Authority: RCW 75.20.100 and 75.08.080. 83-09-019 (Order 83-25), § 220-110-060, filed 4/13/83.]

ATTACHMENT 6

U.S. Army Corps of Engineers
Walla Walla District

Minimizing Effects of Over-Water Docks on Federally Listed Fish Stocks in McNary Reservoir: A Literature Review for Criteria

Anadromous Fish Evaluation Program Report 2010-W68SBV91602084

January 2010

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ATTACHMENT 6

Minimizing Effects of Over-Water Docks on Federally Listed Fish Stocks in McNary Reservoir: A Literature Review for Criteria

Prepared by:

Dennis W. Rondorf, Gary L. Rutz, and Jodi C. Charrier
U. S. Geological Survey
Western Fisheries Research Center
Columbia River Research Laboratory
5501A Cook-Underwood Road
Cook, Washington 98605

Submitted to:

U. S. Army Corps of Engineers
Walla Walla District
201 North 3rd Avenue
Walla Walla, Washington 99362

Report Number 2010-W68SBV91602084

January 2010

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ATTACHMENT 6

Executive Summary

McNary Lock and Dam were completed in 1953, creating McNary Reservoir, or Lake Wallula. The shoreline of the reservoir is federally owned and as a result the U.S. Army Corps of Engineers (USACE) has certain land and fish habitat management responsibilities to balance with other multipurpose benefits. The Endangered Species Act (ESA) listing of Columbia and Snake River salmon stocks has changed the management of salmon harvest, hydropower operations, hatchery practices, and habitat management in recent years. There are 12 salmon *Oncorhynchus* spp., steelhead *Oncorhynchus mykiss*, and bull trout *Salvelinus confluentus* evolutionarily significant units (ESU's) that use this reach of the Columbia River at one or more stages in their life history. Of those 12, 8 are listed as threatened or endangered under the federal Endangered Species Act. The entire portion of the Columbia River in the Hanford Reach and McNary Reservoir is designated critical habitat for seven ESA-listed salmon species.

The USACE is in the process of updating the 1983 McNary Lakeshore Management Plan. The updated Shoreline Plan provides criteria for private use of the federal shoreline of McNary Reservoir, specifically the permitting of private docks, over-water structures, and modifications to shoreline vegetation by adjacent land owners. The previous Shoreline Plan was written prior to the federal listing of salmon species. At the request of the USACE, the purpose of this report is to review information from the literature and determine the extent to which the criteria proposed by USACE for the docks and over-water structures are supported by the current body of scientific knowledge.

A large body of scientific literature was reviewed, including two previous literature reviews conducted to better understand the impacts docks might have on salmonids (Carrasquero 2001; Chapman 2007). Our review of the available literature has yielded the following conclusions (proposed criteria are in *italics*).

- *To prevent damage to shallow water habitat, piers and/or ramps shall extend at least 40 feet perpendicular from the ordinary high water mark (OHWM).*

This proposed criterion serves to locate docks off the nearshore and in deeper water. We have found that there is ample evidence that motor boat activity near shore has a negative impact on vegetative communities. There is also ample evidence that placing the docks in deep water helps to avoid interactions between piscivorous predators and juvenile salmonids.

- *Piers and ramps shall be no more than 4 feet in width.*

- *Grating shall cover the entire surface area (100%) of the pier and/or ramp. The open area of grating shall be at least 50% as rated by the manufacturer.*

- *Grating shall cover 100% of the surface area of the float(s). The open area of the grating shall be no less than 50% as rated by the manufacturer.*

- *Nothing shall be placed on the over-water structure that will reduce natural light penetration through the structure.*

There is strong evidence that changes in the lighting regime can cause changes in fish behavior and predator-prey interactions. We concluded that near docks or over-water structures, the most likely important piscivorous fish species are the introduced smallmouth bass *Micropterus dolomieu* and the native northern pikeminnow *Ptychocheilus oregonensis*. In general, the literature supports the conclusion that as lighting decreases, predation on juvenile salmonids by piscivorous fishes increases. Minimizing the width of the dock and ramp, as well as allowing the maximum amount of light to pass through the dock, helps to reduce the changes in natural daytime lighting.

- *The bottom of the pier or bottom of the landward edge of the ramp shall be elevated at least 2 feet above the plane of OHWM.*

Elevating the landward edge of the ramp above the OHWM raises the ramp, allowing more light to penetrate the water beneath the ramp. The benefits of maximizing light levels are outlined above. We have found no additional biological science to support raising the ramp above OHWM.

- *Skirting shall not be placed on piers, ramps, or floats. Protective bumper material will be allowed along the outside edge of the float as long as the material does not extend below the bottom edge of the float frame or impede light penetration.*

We found no mention of skirting in the literature except where other authors also reported finding no data linked to how skirting might impact predation on juvenile salmonids. Skirting does provide a visual barrier that may be used by predators to ambush prey. Additionally, skirting will likely reduce the amount of light under the dock. Based on our review of predator-prey interactions and reduced light associated with over-water structures, we believe that the literature supports not permitting skirting.

- *Shoreline concrete anchors must be placed at least 10 feet landward from the OHWM and shall be sized no larger than 4 feet wide by 4 feet long, unless otherwise approved by NMFS, USACE, and WDFW.*

No biological science regarding the placement of anchors was found while conducting this review. Minimizing the "footprint" of the anchor would minimize impact to riparian vegetation. The importance and function of riparian vegetation is well documented. Because subyearling Chinook salmon in the nearshore areas of McNary Reservoir consume numerous terrestrial insects apparently associated with riparian vegetation and the surrounding landscape, minimizing the footprint of the anchors and maintaining riparian vegetation has merit.

- *Piling shall not exceed 5 inches in diameter.*
- *Each over-water structure shall utilize no more than 6 piles total for the entire project.*

There are many studies indicating that bass and other predators utilize in-water structure. Pilings also create low velocity areas which are preferred by predators. Minimizing the numbers and size of pilings is supported by the scientific literature.

- *Floats shall not be located in shallow water habitat where they could ground or impede the passage or rearing of any life stage of salmonids. Floats shall be in at least 10 feet of water at all reservoir pool levels including Minimum Operating Pool (MOP) (which is 335 feet above sea level). Depth is measured from the bottom of the landward-most edge of the float.*

Reviewing available literature provides many reasons why newly-constructed docks should be placed in relatively deep water. Smallmouth bass will be attracted to structure. Where bass and juvenile salmonids overlap in habitat, the bass will predate upon the juvenile salmon. Juvenile salmonids use the littoral zone (shallow area along the shoreline where light reaches all the way to the bottom) for rearing (i.e., feeding, resting, refuge from predators). By avoiding the locating of docks in the shallow littoral zone, the impact that docks or over-water structures have on juvenile salmonids can be minimized. Additionally, constructing docks in deeper waters avoids damage to aquatic vegetation and the re-suspension of sediments by boating activity. Both of these deleterious effects may be caused by the operation of motorboats in shallow water near dock.

We reviewed peer reviewed scientific journal articles, technical reports, and other literature reviews regarding predator-prey interactions, habitat use by juvenile salmonids, and the potential impacts docks may have on ESA-listed juvenile salmonids. We found no specific studies or articles that assigned discrete values for the proposed criteria. We have, however, found that maximizing depth, minimizing structure (number and size of pilings), and maximizing light levels all contribute in a significant way to minimizing the impacts that docks and other over-water structures have on federally listed salmonids and other aquatic organisms. Furthermore, we found no studies specifically estimating a change in survival of juvenile salmonids associated with the cumulative effects of intensive development of over-water structure.

Introduction

The U.S. Army Corps of Engineers (USACE) is in the process of updating the 1983 McNary Lakeshore Management Plan. The updated Shoreline Plan provides criteria for private use of the federal shoreline of McNary Reservoir, specifically the permitting of private docks, over-water structures, and modifications to shoreline vegetation by adjacent land owners (Appendix A). The previous Shoreline Plan was written prior to the federal listing of salmon species under the ESA, which provides certain protections. In February 2008, the National Marine Fisheries Service (NMFS), Washington Department of Fish and Wildlife (WDFW), and USACE (Walla Walla District) released the objectives and proposed criteria for docks for public comment. The period of public comment was extended from February 17, 2009 to July 15, 2009. The USACE has received considerable public comment on these criteria and wants to ensure that the criteria are appropriate. The purpose of this report is to review information from the literature and determine the extent that the criteria proposed for the docks and over-water structures are supported by the current body of scientific literature.

McNary Lock and Dam Project was completed in 1953 and created McNary Reservoir, or Lake Wallula which extends from the dam (RM 292) to the free-flowing Hanford Reach (RM 353) of the Columbia River. The multipurpose benefits of the project include navigation, flood control, irrigation, power, and recreation. The reservoir shorelines provide recreational opportunities to visitors and residents of the Tri-Cities (Pasco, Kennewick, and Richland), Washington located upstream of the confluence of the Columbia and Snake rivers (Figure 1). The three municipalities have a combined population of about 235,000 people. The Tri-Cities has over 10,000 registered boats with about a 10% per year growth in boat numbers in recent years (Port of Kennewick 2007). The shoreline of the reservoir is federally owned, and as a result, the USACE has certain land and fish habitat management responsibilities to balance with multipurpose benefits. The USACE has recognized that "there are trade-offs which must be carefully weighed against each other as we all face new decisions about water use in our future" (Mighetto and Ebel 1994). Upstream of McNary Reservoir is the regulated, but free-flowing Hanford Reach of the Columbia River. On June 9, 2000, portions of the Hanford Site, including the Hanford Reach and associated islands, wildlife management areas to the north, White Bluffs, Hanford Dunes, Arid Lands Ecology Reserve, and the McGee Ranch/Riverlands area, were designated as the Hanford Reach National Monument (RM 347-385) to be administered by the Department of Interior.

The ESA listing of Columbia and Snake River stocks of salmon changed the management of salmon harvest, hydropower operations, hatchery practices, and habitat management. During the 1990s, 12 Columbia River Basin (above the Willamette River) salmon and steelhead populations were listed under the ESA (endangered or threatened). Of those 12 Evolutionarily Significant Units (ESU), eight are likely to be found migrating through McNary Reservoir as juveniles or adults (Table 1). The ESA includes a 4(d) section that requires NMFS and U.S. Fish and Wildlife Service (USFWS) to issue regulations to protect listed species by prohibiting "take". Examples of the "take" of a listed species would be the killing or harming of a listed species or destroying or destructively altering the habitat of the species. These definitions led us to question the presence or absence of listed species and to more broad questions about the functioning of riverine and reservoir ecosystems to support restoration of listed salmonid species.

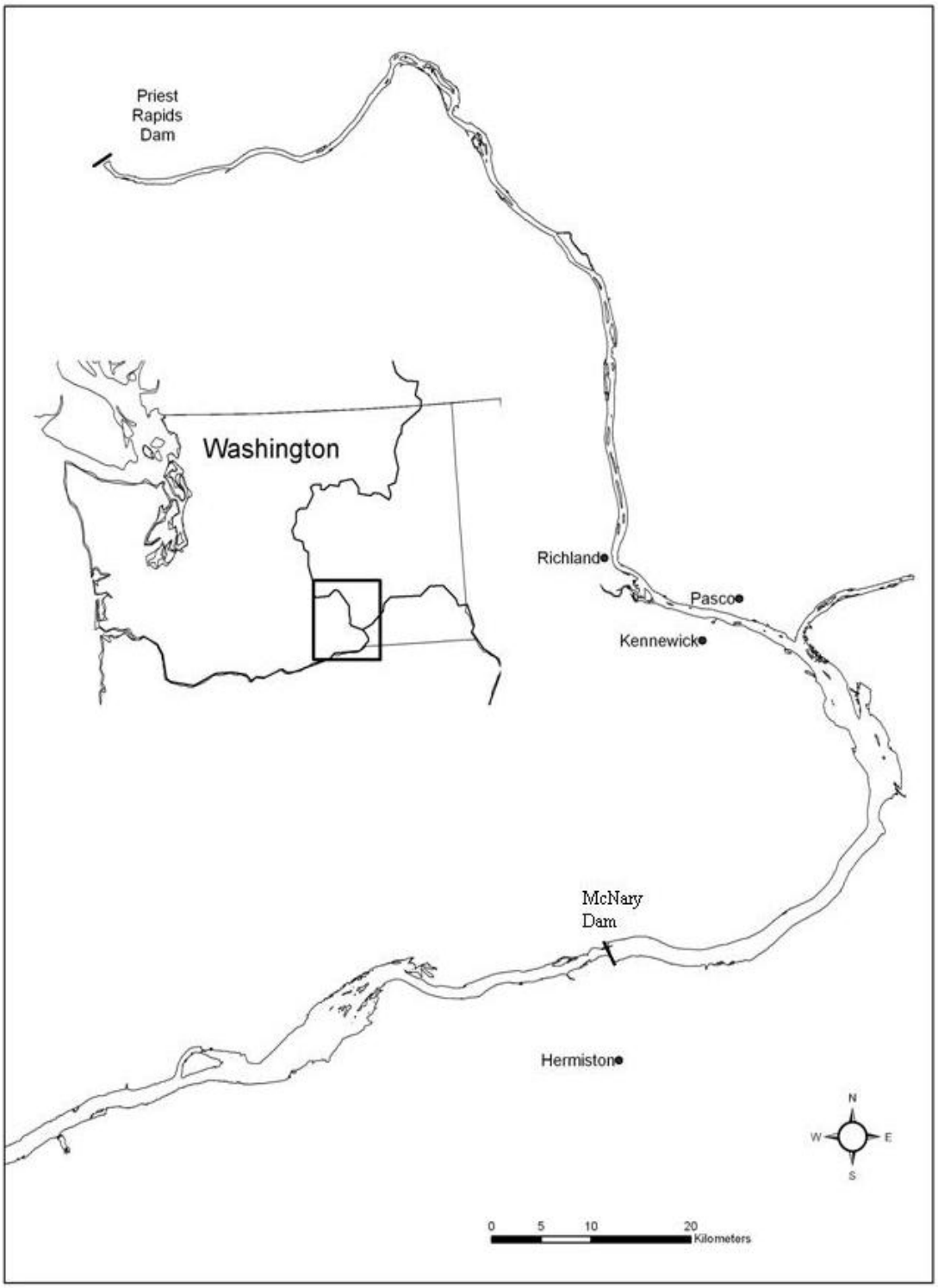

Figure 1. Map of study area on the Columbia River, including McNary Dam, Hanford Reach, and Priest Rapids Dam. McNary Reservoir extends from McNary Dam upstream to Richland, WA and the Hanford Reach extends from Richland, WA upstream to Priest Rapids Dam.

Table 1. Salmonid populations in the Columbia (above the Willamette River), and Snake rivers and their federal protection status.

Species	**Evolutionarily Significant Unit (ESU)**	**Federal ESA status**
Chinook	Snake River Fall Chinook[a,b]	Threatened
	Snake River Spring/Summer Chinook[a,b]	Threatened
	Upper Columbia River Spring Chinook[a,b]	Endangered
	Upper Columbia River Summer/Fall Chinook[a]	Not Warranted
	Mid-Columbia River Spring Chinook[a]	Not Warranted
	Lower Columbia River Chinook	Threatened
Coho	Lower Columbia River Coho	Threatened
Chum	Columbia River Chum	Threatened
Sockeye	Snake River Sockeye[a,b]	Endangered
	Okanogan River Sockeye[a]	Not Warranted
	Lake Wenatchee Socheye[a]	Not Warranted
Steelhead	Snake River Steelhead[a,b]	Threatened
	Upper Columbia River Steelhead[a,b]	Threatened
	Middle Columbia River Steelhead[a,b]	Threatened
	Lower Columbia River Steelhead	Threatened
Bull Trout	Columbia River Bull Trout[a]	Threatened

[a]Fish which use the Hanford Reach and McNary Reservoir as a migration and/or rearing corridor.
[b]Fish with designated critical habitat in the Hanford Reach and McNary Reservoir.

The reach of the Columbia River including the Hanford Reach and McNary Reservoir is designated critical habitat for seven ESA-listed salmon species (Table 1). The ESA protects threatened and endangered species in several ways. Under Section 7, all federal agencies must ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species, or destroy or adversely modify its designated critical habitat. These complementary requirements apply only to federal agency actions, and the latter only to habitat that has been designated. Critical habitat is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. A critical habitat designation does not set up a preserve or refuge, and applies only when federal funding, permits, or projects are involved. Critical habitat requirements do not apply to citizens engaged in activities on private land that do not involve a federal agency.

Although this review is in response to issues directly related to the ESA listing of salmonid species that use McNary Reservoir as rearing habitat or a migration corridor, the ESA is not the only federal responsibility. Below are several federal regulations that may have jurisdiction for activities related to docks and over-water structures (Carrasquero 2001). In addition to these regulations, state and local governments have jurisdictional responsibility and it is in their interest to restore listed species in order to avoid future costs and regulations.

Regulatory Framework Governing Over-water Structures:

- *National Environmental Policy Act (NEPA)*

Federal agencies making funding decisions or issuing permits for over-water structures are required to comply with the National Environmental Policy Act.

- *Clean Water Act Section 404*

Construction of over-water structures that would result in discharge or excavation of dredged or fill material requires a Clean Water Act section 404 permit.

- *Rivers and Harbors Act Section 10*

Any work affecting navigable waters of the United States that extends to the ordinary high water mark in freshwater areas (including the construction of piers, docks, and floats) requires a section 10 permit issued by USACE.

- *Endangered Species Act (ESA)*

The Endangered Species Act provides broad protection for fish, wildlife, and plant species that are listed as threatened or endangered. The shoreline development activities that have federal nexus (i.e., federal funds or federal permits) are subject to review under the statute.

- *Fish and Wildlife Coordination Act*

This act requires consultation with the USFWS and the fish and wildlife agencies of States where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted, or otherwise controlled or modified" by any agency under a Federal permit or license.

- *Magnuson-Stevens Fishery Act*

The Magnuson-Stevens Fishery Act provides a national program for the conservation and management of the fishery resources of the United States. It provides broad powers to the National Marine Fisheries Service to rebuild overfished stocks, insure conservation, and to facilitate long-term protection of essential fish habitats.

- *Other State and Local Regulations*

There are many other state and local regulations including the State Environmental Policy Act, Shoreline Management Act, Clean Water Act, National Pollutant Discharge Elimination System, Hydraulic Project Approval Code, Forest Practices Act, Aquatic Lands Act, Water Pollution Control Act, Aquatic Resource Mitigation Act, Salmon Recovery Act, Wetland Mitigation Banking, and various county and city shoreline management plans.

We reviewed a wide variety of information to determine if the proposed dock criteria were supported by facts in the scientific literature. We started with several recent reviews on the biological effects of docks and over-water structures. We recognized that such reviews may or may not be biased, but they do represent the work of other authors that have evaluated the merit of relevant studies in the literature. Subsequently, we examined the peer-reviewed articles published in scientific journals and gave those articles the greatest weight in this review. Concurrently, we identified many technical reports prepared by other scientists and professionals that present information we considered relevant.

Criteria for the construction of over-water structures, such as private docks, have been developed by local, state, and federal agencies as guidance to parties within their jurisdiction proposing to construct over-water structures. To add perspective and understand the reasoning leading to dock criteria, we briefly reviewed some criteria from other regions of the U.S. such as the Southeast and Midwest (NOAA 2003; USACE 2005). To add a Northwest regional perspective, we reviewed dock criteria or reviews from the Puget Sound area and the Wells Dam Pool on the mid-Columbia River (Simenstad et al. 1999; Carrasquero 2001; Chapman 2007). We looked to entities having jurisdiction in the Columbia River Basin and reviewed proposed dock and over-water structure criteria of the Washington Department of Fish and Wildlife.

We have organized the results of this review paper in two primary sections followed by a brief discussion. The first section is the “Background” and the second section is the “Proposed Criteria and Findings”. During the review, it became evident that the risk of predation for juvenile salmonids may increase for juvenile salmonids near docks and over-water structures. Because no studies specifically evaluated docks and predation risk to juvenile salmon in McNary Reservoir, some readers may feel the available literature provides little information. That is not the case. Most scientists strive to demonstrate broadly applicable functional relations in biology and peer-reviewed journals prefer to publish papers that are broadly applicable. Therefore, in

this review we start by presenting compelling findings about predators, predator-prey relations, light, and habitat from a wide range of locations and habitats. However, in weighing the information during our review, we did not restrict our observations to predator-prey relations to large rivers, but selectively included lakes, streams, and marine environments. In an attempt to be selective, we relied most heavily on descriptions of the distribution and biology of juvenile salmonids from McNary Reservoir and the nearby reaches of the Columbia and Snake rivers. In the Proposed Criteria and Findings section, we present information from the literature most applicable to the proposed criteria along with our findings.

Background

Dock Criteria of Other Jurisdictions

We conducted a literature search to survey dock criteria as required in other jurisdictions. We have examined city, county, state, and federal documents from several regions of the United States and Canada. Many regulatory agencies have some criteria regarding the permitting of docks in their jurisdiction. We did not find any dock criteria specifically addressing concerns posed by the Endangered Species Act. However, most localities share some of the same concerns related to over-water structures such as:

- Adverse impacts to biological communities that provide functions to fish and wildlife, such as seagrass and other aquatic vegetation (such as marshes and mangroves) - due to shading and dredge/fill activities.
- Loss of endangered species
- Adverse effects of docks on other wetland-dependent species - for instance, those that nest and breed in the uplands and in adjacent shellfish beds.
- Degradation of water quality - turbidity from installation of related pilings and leaching of chromium, arsenic, and copper from such pilings.
- Propeller dredging and other dredging of access channels sometimes associated with dock use
- Loss of archaeological and historical resources

Specifically, we have found that in North and South Carolina, Georgia, and Florida dock criteria regulate maximum length, width, minimum height above the water and total square footage. Federal managers in these states cite a lack of conclusive research on cumulative impacts of docks, and finding and accessing the research that has been done as the main difficulty in managing the permitting of docks and piers (NOAA 2003).

Wisconsin regulates residential docks on private lands, and has requirements regarding the construction, size, and placement of the dock. Again there seem to be no “listed salmonid specific” criteria. Other states such as Oregon and Minnesota are in a transitional period. They have recognized the need for reform and regulation of over-water structures but have not yet published specific criteria for the construction of residential docks.

Salmonids in the Nearshore

Bull trout are listed as threatened under the ESA (Table 1) and have fluvial, adfluvial, and anadromous forms (Brenkman and Corbett 2005; USFWS 2008). Bull trout show diverse life histories and most live in cold-water tributaries in the Columbia River Basin. However, bull trout can also move from natal watersheds to other watersheds and marine waters (Brenkman and Corbett 2005). McNary Reservoir may provide connectivity between populations of bull trout in watersheds such as the Walla Walla River and the Yakima River. As habitat in the lower reaches of tributaries is restored, it is possible that the connectivity provided by reservoirs will become more evident. Reservoir habitats are probably mainly used by adult bull trout for overwintering and migration. Nelson and Nelle (2008) showed that some adult bull trout overwinter in reservoirs in the upper mid-Columbia River where several tributaries have bull trout populations. We did not find information indicating that juvenile or adult bull trout specifically used the littoral areas of the reservoir, and the current available information does not suggest that use of reservoir littoral habitats would be very high if populations are restored in tributaries.

Adult fall Chinook salmon historically spawned from the main-stem Columbia River, near The Dalles, Oregon, upstream to the confluence of the Kootenai River in British Columbia (Fulton 1968; Dauble and Watson 1997). Impoundment by hydroelectric dams has blocked access to more than 75% of their historic spawning habitat (Van Hyning 1969; Horner and Bjornn 1979; Dauble and Watson 1997). Primary spawning areas for upriver fall Chinook salmon in the Columbia River are now restricted to the Hanford Reach, RM 341-397 (Dauble 2000) and the tailraces of main-stem dams (e.g., McMichael et al. 2005). Spawning surveys conducted on the Hanford Reach have shown that redds are concentrated upstream of RM 348 (Groves 1999; Geist 2000; Dauble 2000). These redds are produced by fall Chinook salmon and no steelhead redds were found during aerial surveys conducted by Mueller (1999). As much as 80% of spawning in the Columbia River probably occurs in water too deep to be observed by above-water surveys (Chapman 1986; Swan 1989; Groves 1999). We concluded adult salmon and steelhead use of the nearshore area is probably minimal so we further restricted our review to the juvenile life stages of salmon.

The life history patterns of Pacific salmonids are complex and are expressed by high diversity in the seaward migration timing and habitat use by juvenile salmonids. However, even observations made in recent decades about migration patterns of juvenile salmonids may not capture the richness or plasticity of salmon life history patterns that were historically present in the Columbia River. For example, a wide variation in life history patterns is evident from the observations of Rich (1922) in the lower Columbia River. In the upper Columbia River, steelhead can migrate to the ocean at ages ranging from one to seven years (Peven et al.1994). Chinook salmon can be divided into ocean-type and stream-type, as well as spring, summer, and fall runs (Carl and Healey 1984). Ocean-type salmon migrate to the ocean during their first year and stream-type salmon spend one or more years rearing in natal streams. Upper Columbia River sockeye *Oncorhynchus nerka* migrate from Lake Okanagan and Lake Wenatchee at different sizes. In general, juvenile salmon of different sizes often have different behavior, disposition to migrate, and distribution in reservoirs (Peven 1987).

Millions of juvenile salmonids migrate through McNary Reservoir each year. The Hanford reach alone produces 20-30 million subyearling fall Chinook salmon annually, (Washington Department of Fish and Wildlife, unpublished data) many of which rear in Lake Wallula. These fall Chinook salmon are not ESA-listed (Table 1). Wild and hatchery stocks of fall and spring Chinook salmon, sockeye salmon, coho salmon *Oncorhynchus kisutch*, and steelhead migrate through this reach each spring and summer. Of these species, juvenile fall Chinook salmon are the most likely to inhabit the littoral zone (Dauble et al. 1989; Rondorf et al. 1990). However, other stocks are occasionally found near shore in smaller numbers (Mains and Smith 1956, Dauble et al. 1989). Moreover, juvenile salmonids in the littoral zone commonly assumed to be fall Chinook salmon are probably intermixed with spring Chinook salmon stocks, which are listed as endangered.

Subyearling Chinook salmon use shallow, nearshore areas from the time they emerge from the redd until the time they reach approximately 80 mm in length. They rear in the littoral zone from approximately March through June (Chapman 2007). As they grow, they increasingly use deeper water, though they continue to move into the shallows at night to rest on the bottom. Some subyearlings remain in the main-stem Columbia River to over winter and migrate downstream as yearlings. These may be either ocean or stream type fish though this is the defining life history pattern for stream-type Chinook salmon. As subyearlings become larger than 60-70 mm, their behavioral tendency to use offshore habitats reduces their susceptibility to predators in the littoral zone and, hence, their vulnerability around docks (Chapman 2007). As the subyearlings begin to move downstream, they continue to use the littoral zone for feeding and resting.

Mains and Smith (1956) conducted a two-year study on the Columbia and Snake rivers and found that juvenile Chinook salmon began migrating downstream in March and the migration was virtually over by the beginning of July. Seaward migrating Chinook salmon passed Beyers Landing (RM 341) on the Columbia at the upper end of the McNary Reach during all hours of the day. Peak movement occurred between 1800 hours and 0600 hours, but fish were caught throughout the day. Nets deployed closest to shore (about 100 ft from shore) accounted for 68% of the total sample. Approximately 76% of fish were age 0 that were 36-55 mm in length. The remaining 24% of fish were age 1+ that were 85-105 mm. These 85-105 mm fish represent spring Chinook salmon, and the 36-55 mm fish represent fall Chinook salmon. Chinook salmon were present in considerable numbers over the entire width and depth of the river. Subyearling fall Chinook salmon preferred the surface layers and water near the shoreline whereas spring Chinook salmon generally occupied deeper waters farther from shore.

Dauble et al. (1990) conducted a similar study in 1989 during the spring out-migration. They found that 52% of subyearling fall Chinook salmon were caught within 100 ft of shore in water 5.9 m deep, or less. In contrast, yearling spring Chinook salmon used deeper water with only 7% of fish being caught within 100 ft of shore in water 5.9 m deep, or less. Sockeye salmon also used deeper water with 3% of fish being caught from waters less than 5.9 m deep.

Although both of these studies demonstrate that spring Chinook and sockeye salmon mainly use deeper water during their downstream migration, they also show that some fish are

found in the littoral zone. Additionally, the most abundant group in the littoral zone—subyearling fall Chinook salmon—is likely composed of both fall and spring (ocean and stream) type Chinook salmon. In most cases, these groups are visually indistinguishable. Marshall et al. (2000) used allozyme allele frequency differences to identify subyearling Chinook salmon caught in beach seines along the lower Snake River. They found that a large proportion of subyearlings were actually spring Chinook salmon. In fact, in 1991, 50% of the subyearlings caught in beach seines were spring Chinook salmon. In 1993, 62% of the subyearlings sampled along the lower Snake River were spring Chinook salmon. In 1994 and 1995, spring Chinook salmon composed 14% and 5% of the total catch, respectively. They concluded that although the timing and sample locations were selected to capture subyearling fall Chinook salmon, numerous subyearling spring Chinook salmon were also found in non-natal, main-stem areas. In a subsequent study, Connor et al. (2001) concluded that subyearling spring Chinook salmon are capable of dispersing long distances from natal stream habitats to main-stem riverine habitats. These subyearlings that rear along the shorelines of main-stem habitats are able to exploit the higher growth opportunity found there and reach smolt sizes as subyearlings. Though these studies have not been repeated in the McNary Reservoir, it is reasonable to expect subyearling spring Chinook salmon to occasionally use nearshore, main-stem habitats just as fall subyearlings do. As spring Chinook salmon populations are restored, we believe studies will show their life histories and habitat preferences are more diverse than many expect. We conclude that although subyearling fall Chinook salmon are abundant and not listed, listed stocks of salmonids will use nearshore areas as well.

Predators

Predation by piscivorous fish and birds is the principal mechanism of mortality of juvenile salmonids migrating through Columbia River reservoirs (Chapman et al. 1994). The most significant predators of salmonids in the Columbia River reservoirs are smallmouth bass, northern pikeminnow, walleye *Sander vitreus*, and channel catfish *Ictalurus punctatus* (Rieman et al. 1991; Vigg et al. 1991). Smallmouth bass is a non-native predator that has flourished in reservoir habitats. It was introduced to the West Coast in 1874 (CA) and the Yakima River in 1925 (Boersma et al. 2006). By the early 1940's, smallmouth bass were well established and plentiful in the Columbia River up to the Snake River (Lampman 1946). Northern pikeminnow are native predators that consume large numbers of juvenile salmonids annually. Both channel catfish and walleye are known to prey on juvenile salmonids, but to a less extent than smallmouth bass and northern pikeminnow.

Much attention has been directed toward non-indigenous species in the past few years. A recent count of non-native species that have successfully established populations in WA, OR and ID is over 900 (Sanderson et al. 2009). The effects of non-native species invasions and habitat degradation are the two leading causes of decline of native species in North American freshwaters (Richter et al. 1997; Wilcove et al. 1998). On the Columbia River, reservoirs created by hydroelectric dams have created prime habitat for non-native species to thrive and spread. For example, the population of American shad *Alosa sapidissima* has dramatically increased in recent years. A peak of 5.3 million adults were counted at Bonneville Dam in 2004. Juvenile American shad may reduce zooplankton biomass and act as a food source for predators. However, it is unclear how severely shad are affecting salmon populations (Petersen et al. 2003).

The littoral zone of the Columbia River is seeing a shift from native resident fish to non-native species (ISAB 2008). Of concern is the proliferation of predators in these habitats.

Avian predation constitutes a significant source of mortality to juvenile salmonids during out-migration. Rates of predation on juvenile salmonids by piscivorous birds may range from 5-15 million out migrating smolt each year (Collis and Roby 2008). Over the past 40 years the populations of gulls *Larus spp.*, terns *Sterna spp*., cormorants *Phalacrocorax spp.*, and pelicans *Pelecanus spp.*, in the Columbia Basin have increased, in some cases dramatically (Collis et. al 2002). Construction of docks and pilings can create habitat for perching birds such as cormorants. This perching habitat may be limited by the use of pile caps and other avian exclusion devices. Over-water structures and related construction activities that modify the shoreline configuration (e.g., increasing the shoreline slope and eliminating shallow-water habitat refugia) could potentially affect predation rates by piscivorous birds on salmonids. This may occur, for example, if the shore-zone habitat and shallow habitat refugia are eliminated, forcing juvenile fish to venture into deeper waters where predator diving birds may have increased success. This is of particular importance to juvenile Chinook salmon, which have the greatest affinity to shore-zone shallow-water habitats (Garland and Tiffan 1999; Rondorf et al. 1990).

Our review led us to consider the proposed criteria and how these changes will affect predator-prey interactions in the littoral area of McNary Reservoir. Extensive literature research confirms that our knowledge on many of these topics is limited. Empirical evidence is lacking and much of the scientific information is based on research of other species and other ecological systems (free-flowing rivers or lakes). In the Northwest, studies have been conducted on predator use of over-water structures, but many of these were conducted in Lake Washington and Lake Sammamish (Stein 1970; Pflug 1981; Pflug and Pauley 1984; Kahler et al. 2000; Fresh et al. 2003). Though numerous research studies have been conducted on predator-prey relations in Columbia River reservoirs, none of the studies has addressed the use of docks and piers. Much of the literature on light and its relation to over-water structures and predator-prey interactions was derived from laboratory experiments.

The salmonid prey most likely to be found near over-water structures in the littoral zone is the migrating ocean-type juvenile fall Chinook salmon. Nearshore habitats in the main-stem Columbia River within the study area are critically important for subyearling fall Chinook salmon (Dauble et al. 1989; Rondorf et al. 1990). Since salmonid fry and juveniles use the littoral zone as rearing habitat, they are most vulnerable to predators. Most predation on juvenile Chinook salmon in the Columbia River occurs during the peak of their out-migration (Gray and Rondorf 1986; Vigg et al. 1991; Poe et al. 1991; Zimmerman 1999). After subyearlings become larger than 60 to 70 mm, their behavior greatly reduces their vulnerability to predators in littoral zones and around docks (Chapman 2007). Larger smolts (i.e., yearling Chinook salmon, steelhead, and sockeye) use deep, mid-channel areas in contrast to subyearling Chinook salmon, which use shallower shoreline areas (Dauble 2000).

Over-water structures may increase predation of juvenile Chinook salmon in several ways. First, piers and docks can provide cover and preferred habitat for ambush predators such as smallmouth bass. Second, they create shaded areas that can increase a predator's capture

efficiency of prey. Third, they interrupt migration routes and timing of migrating salmonids. The additional time spent navigating around these structures increase exposure to predators in these areas. Finally, changes in substrate, aquatic vegetation, and ambient light caused by over-water structures may indirectly increase predation through complex ecological pathways.

Since the primary disruption of predator-prey interactions associated with over-water structures is probably greatest in the littoral zone, we will focus on predators that use nearshore habitat: northern pikeminnow and smallmouth bass. Both predators are generalist piscivores, practicing visual, ambush, and habituation foraging type hunting styles. Northern pikeminnow feed primarily on juvenile salmonids (Petersen et al. 1993), are the primary predator of juvenile salmonids in Columbia River reservoirs (Poe et al 1988; Vigg et al. 1991; Zimmerman 1999), and have the greatest potential for predation of juvenile salmonids (Beamesderfer and Rieman 1988). Smallmouth bass are also a substantial predator of subyearling Chinook salmon because of the overlap in rearing habitat between the species (Curet 1993; Tabor et al. 1993; Garland and Tiffan 1999).

Consumption

Consumption rates of smallmouth bass and northern pikeminnow vary among species, habitat, and prey availability. Tabor et al. (1993) found that subyearling Chinook salmon made up 59% of smallmouth bass diets and 28.8% of northern pikeminnow diets in a study conducted during May and June upstream of McNary Reservoir. These authors showed smallmouth bass consumed 1.0–1.4 salmonids/day and northern pikeminnow consumed 0.3–0.6 salmonids/day Research conducted from 1983 to 1986 concluded that resident predator fishes consumed between 1.9 and 3.3 million juvenile salmon and steelhead annually in the John Day Reservoir alone. Northern pikeminnow accounted for 78% of the losses, which equated to 1.5-2.6 million fish or 7.2% of the run of 19 million salmon migrants (Rieman et al. 1991). Petersen et al. (1993) estimated that losses of juvenile salmonids to northern pikeminnow decreased to 1.4 million per year (7% of run) if stratified by four or more reservoir areas rather than the two areas used by Rieman et al. (1991). The findings of Beamesderfer (1996) mirrored both Rieman and Petersen's results closely: northern pikeminnow consumed an estimated 16 million migrants per year or about 8% of the population. Zimmerman (1999) suggested that salmonids are only seasonally abundant in bass diets in the Columbia River and that other fish species, crayfish and invertebrates are the major source of food during the rest of the year. There is evidence that consumption rates and energetic demands of northern pikeminnow and smallmouth bass increase between spring and summer as temperatures rise (Vigg et al. 1991; Petersen and Ward 1999).

Non-native species consume significantly more juvenile salmonids as water temperatures rise (Vigg et al. 1991). Consequently, predators that use shallower, warmer habitats near shore will consume more prey compared to those that select cooler temperature off shore. Centrarchids (e.g., sunfishes such as bass) have greater tolerance for higher expected average water temperatures than native salmonids and other resident species (ISAB 2008). Climate change models predict an increase of 1°C or greater in the Columbia and Snake River reservoirs by 2040 (Hamlet and Lettenmaier 1999; Payne et al. 2004). These increases in temperature will result in higher growth rates and consumption by predators. Subyearling fall Chinook salmon will suffer the most from these changes due to late spring and summer migrations coinciding

with the hottest months of the year and highest consumption rate by predators (Poe et al. 1991; Vigg et al. 1991).

Nearshore Habitat Use

We focused our review on nearshore, littoral habitats because these are most important for rearing salmonid and are also important to predators. Subyearling Chinook salmon rear along shallow main-stem shorelines for 2 to 4 months in the spring following emergence (Tiffan et al. 2006). After this time, larger fish migrate downstream during late spring and through the summer. As the salmon migrate downstream, they increase in size and move farther offshore. In McNary Reservoir, subyearling Chinook salmon favored water less than 2 m deep in May and moved to deeper water as they approached 80 mm in June (Grey and Rondorf 1986). In the Hanford Reach, juvenile Chinook salmon used nearshore depths of 0.75 m until about June (Vendetti et al. 1997) and preferred low lateral bed slope (<30%) with velocities less than 0.4 m/s (Tiffan et al. 2002).

These shallow shoreline habitats with low velocities and slopes offer juvenile salmon refugia from predatory fish that may be too large to enter very shallow water. Several studies have shown lack of predation in the littoral zone making this a safe place for small fish to rear and feed. Feeding rates by fish smaller than 100 mm was 10 times higher in shallow water (<10 cm) than in the rest of the littoral zone (Collins et al.1995). Brown (1998) observed no piscivores in "littoral fringe" (within 2.5 m of shore) transects in Lake Joseph, Ontario. These findings support the criteria for the minimum 10 feet depth of water and the placing of the dock 40 feet from the OHWM. Savino and Stein (1989) found that largemouth bass captured all prey fish that strayed from areas with aquatic vegetation into open water, demonstrating that refuge is critical for prey survival. Bass preyed on grazing minnows from all but the shallow sections of pools in Oklahoma streams (Power et al. 1985).

Although shallow waters provide warmer temperatures that enhance growth, seasonal warming in nearshore habitats of the Columbia River ultimately causes temperatures to become too warm for salmonids. By mid to late summer, nearshore areas often become too warm for rearing subyearling Chinook salmon (Tiffan et al. 2006). Curet (1993) observed fish moving into deeper, cooler waters when shoreline areas became too warm in the Lower Granite Reservoir. During a study in the Columbia River, Key et al. (1994) found that optimal temperatures for sampling subyearling Chinook salmon were between 12-15.9°C and that catch decreased significantly when temperatures were any warmer. Average temperatures in the Columbia River can reach 20–21.5°C in August and September, (Goniea 2006) whereas nearshore temperatures can be much higher. By this time, most subyearling Chinook salmon have left nearshore areas and are actively migrating seaward.

The littoral zone also contains the highest abundance of terrestrial insects, the preferred food for subyearling Chinook salmon in McNary Reservoir (Rondorf et al. 1990). This close relation between the diet of subyearling Chinook salmon and riparian vegetation and possibly the upland landscape is important to recognize when considering criteria for shoreline use in urban areas. The preferred diet of juvenile Chinook salmon in the Hanford Reach differs from that in McNary Reservoir. Rondorf et al. (1990) found that caddisflies (64% by weight) were preferred

by fish in the Hanford Reach, whereas zooplankton and especially terrestrial insects, were abundant in diets of fish in McNary Reservoir. These findings are consistent with those of Becker (1973) and Dauble (1980) who also observed caddisflies making up the majority of juvenile Chinook salmon diets in the Hanford Reach. Wiggins (1977) also reported caddisflies making up 64% by weight of the diet of fish in riverine reaches, but less than 1% of the diet in reservoir reaches. In a study of lower Columbia River reservoirs, Craddock (1976) showed that terrestrial insects were the major component in juvenile Chinook salmon stomachs in the spring and fall.

Developed shorelines may limit available habitat for juvenile salmonids while providing habitat for predator species. Numerous studies in the mainstem Columbia and Snake rivers report that subyearling Chinook salmon prefer sandy or small gravel/cobble substrate and avoid complex habitats such as bedrock cliffs and riprap (Bennet et al.1992; Curet 1993; Key et al.1996; Garland and Tiffan 1999). In McNary Reservoir, substrate size was the most important factor in determining subyearling Chinook salmon presence in nearshore habitats (Garland et al. 2002). These authors found that dominant substrates larger than 256 mm (i.e., riprap) have the lowest probability of subyearling salmon presence. Key et al. (1996) observed that predator species were often located in riprap areas in McNary Reservoir. Riprap shoreline constitutes 23% of the McNary Reservoir according to a study done by the USACE in 1976.

In contrast to juvenile salmonids, smallmouth bass prefer hard substrates such as cobble/gravel and steep drop-offs lacking aquatic vegetation (Coble 1975; Pflug 1981; Pflug and Pauley 1984). Ninety percent of the smallmouth bass sampled in a study of the upper McNary Reservoir were collected from low-velocity backwater areas along the shoreline (Tabor et al. 1993). When smallmouth bass are found over sandy substrates, they show an active hunting behavior and pelagic feeding (Danehy and Ringler 1991). According to Dauble et al. (1989), wild fall Chinook salmon may be more vulnerable to predation by smallmouth bass because they are often smaller and more abundant in nearshore areas than hatchery-released fall Chinook salmon. McNary Reservoir contains significant reaches of sand and gravel shoreline and bass have adapted to use this habitat in absence of more complex substrate.

Northern pikeminnow in Columbia River reservoirs occupy free-flowing areas with low-velocity (1-foot per second or less) microhabitats and back-eddies (Beamesderfer and Rieman 1988; Petersen et al 1992). Northern pikeminnow are the primary predator of juvenile salmonids in Columbia River reservoirs (Poe et al 1988; Vigg et al.; 1991; Zimmerman 1999). The predation of northern pikeminnow upon salmonids is of such great concern that since 1990, there has been a federally administered angler reward program in the main-stem Columbia and Snake rivers. From 1990 to 2008, over 3.3 million northern pikeminnow were removed by the sport reward program and it is estimated that predation on juvenile salmonids has been reduced by 37% (pikeminnow.org 2009). Pilings supporting over-water structures create backwater, low-velocity habitat preferred by these predators, likely contributing to their overall biological success.

Structure Use

Several studies suggest that bass populations benefit from use of docks and piers in lakes. Bass will use simple structures in the absence of more complex natural habitat. However, it is unclear what feature (or combination of features) is actually attracting them to the structure. Smallmouth bass in flowing systems use the overhead cover and low-velocity refuge provided by physical structure (Probst et al. 1984; Rankin 1986; Todd and Rabeni 1989). Hanes and Butler (1969) showed that structures providing shade were selected most frequently by yearling smallmouth bass. In Lake Joseph, Ontario, densities of young-of-the year smallmouth bass were highest in areas with high concentrations of shorezone structures (Brown 1998). In Spirit Lake, Iowa, smallmouth bass were the only juvenile species (of the 20 sampled) that were found in equal or greater abundance in developed sites than in undeveloped sites (Bryan and Scarnecchia 1992). During a SCUBA survey in Lake Washington, 72% of smallmouth bass were observed laying within 2 m of some sort of structure, and they preferred large docks with large numbers of pilings (Fresh et al. 2003).

Bass often build nests near over-water structures, and the protection they afford may contribute to their reproductive success. Male smallmouth bass in Lake Sammamish generally built nests within 7 to 20 m of shore, on gently sloping gravel/cobble substrates, devoid of vegetation at depths of 1 to 3 m, and near a structural element such as log, boulder, pile, or other artificial structure (Pflug and Pauley 1984; Kahler et al. 2000). Smallmouth nests were also found close to sheltered habitat in Bull Shoals Reservoir (Vogele and Rainwater 1975). Building nests adjacent to structures can provide visual isolation and reduce area that must be guarded by male parents. It is likely that the construction of over-water structures near shore and in less than approximately 3 m of depth will increase the reproductive success of smallmouth bass.

Perhaps another attraction of bass to over-water structures is due to the visual advantage gained for foraging. Helfman (1979; 1981) found that the number of fish using shade-producing objects as cover on bright days was directly related to the dimensions of the structure. Largemouth bass preferred large to small study floats that shielded them from high light intensities suggesting that the created shade provided a visual advantage for predators to see approaching prey. A shaded predator can see sunlit prey more than 2.5 times as far away compared to the distance a predator in bright light can see prey in a dark area (Helfman 1981). Therefore, prey fish may use the shade provided by small floating objects to avoid being detected by a predator approaching from the brightly lit surrounding area.

We found no empirical evidence in the literature on how northern pikeminnows use over-water structures. Studies conducted on the lower Willamette River in Oregon did not find a relation between shoreline development (including piers) and northern pikeminnow predation on outmigrating Chinook salmon (Ward et al.1994; Friesen 2006). However, it is noteworthy that these studies had small sample sizes and took place in areas with relatively low densities of predators. In contrast, pile fields and pile dikes consistently produced high electrofishing catches of northern pikeminnow in the Columbia River downstream of Bonneville Dam (Conrad Frost, U.S. Geological Survey, personal communication). It is reasonable to assume that where pilings provide sufficient refuge from surrounding velocity, northern pikeminnow will use them.

Light

Light is important to a variety of biological functions of juvenile salmonids, particularly in shallow nearshore waters. Light functions as a biomarker in such complex biological interactions as: foraging, schooling, predator avoidance, visual orientation, and migration (Simenstad et al. 1999). As such, changes in ambient light conditions could alter the physiology and behavior of juvenile salmonids that may ultimately affect their survival.

It is important to consider whether artificial illumination outside of the normal circadian cycle affects organisms. Artificial lighting that is often present on over-water structures may disorient migrating juvenile salmonids, compromise their ability to avoid nocturnal predators, and affect the photosynthesis of aquatic vegetation. Little is understood about how artificial lights affect these complex ecological systems. Many laboratory experiments have been conducted in order to test the effects of artificial light on fish behavior. However, it is not always possible to extrapolate behavioral responses from the laboratory to the field. McDonald (1960) showed that downstream migration of sockeye and coho salmon fry was inhibited when artificial lights illuminated experimental stream channels; but when the lights were turned off, migration resumed as normal.

Light also affects the efficiency of sight-feeding predators and the behavior and vulnerability of prey. For example, there is a strong correlation between illumination and foraging efficiency in juvenile Chinook salmon. Juvenile salmonids feed primarily on drifting invertebrates during sunrise and dusk, but do not feed during complete darkness (Brett and Groot 1963; Fraser et al. 1997). The presence of artificial light may facilitate juvenile fish feeding which in turn may increase their vulnerability to predation at night. The dependence of invertebrate behavior on light is also well documented. The diel vertical migrations of zooplankton and invertebrates such as *Neomysis mercedis* depend largely on light as a proximate cue (Forward and Hettler 1992; Haskell and Stanford 2006). The presence of artificial light may alter zooplankton and invertebrate behavior making them more vulnerable to predation. The role that artificial light plays in the feeding behavior of piscivorous predators may be more complex.

Intuitively, one might think that additional light would be beneficial to visual ambush predators. However, Petersen and Gadomski (1994) found that with increasing light intensity the predation rate between northern pikeminnow and juvenile Chinook salmon decreased. This suggests that northern pikeminnow feed more actively under the low-light such as at dusk and dawn. This relationship was also shown during studies between sculpin and sockeye fry (Tabor et al.1998). This was probably due to an enhanced ability of the fry to detect and avoid sculpin, rather than a suppression of sculpin predatory behavior. Sculpin are non-visual hunters; so in darkness they may use some other sensory mechanisms besides vision to detect prey. We expect the amount of illumination provided around over-water structures at night to be relatively low, and may be more typical of dawn and dusk periods when predatory fishes actively feed.

There is ample scientific literature to support the notion that migrating juvenile Chinook salmon become disoriented when confronted with shaded habitats. Migrating juvenile salmon tend to avoid overhead cover and instead maneuver along the edges rather than penetrate them (Prinslow et al. 1980; Weitkamp 1982; Ratte and Salo 1985; Dames and Moore 1994; Taylor and Willey 1997; Pentec Environmental 1997). This behavior has also been seen in other fish species that are reluctant to enter covered or darkened structures (Glass and Wardle 1995;

Welton et al. 2002). It is unclear how this may affect energetic and predatory costs to the fish, but it is commonly assumed to be detrimental to survival (Simenstead et al. 1999). Taylor and Willey (1997) observed schools of juvenile salmon splitting into groups and entering a state of confusion when confronted with overhead shading. The reason for this behavior is also unknown, but it may be a predator avoidance mechanism (Scheuerell and Schindeler 2003). Kemp et al. (2005) found that when migrating subyearling Chinook salmon (average 95 mm) were faced with the choice of covered and uncovered channels at McNary Dam, 75% of the fish avoided the covered channels. This behavior was size related with smaller fish being most likely to avoid traveling through shaded habitat.

Visual Adaptations of Predators and Salmonids

Due to the complex nature of light in water, fish have evolved well-developed and highly specialized eyes. The *Oncorhynchus* sp*p*. eye contains a large number of rods and cones, showing that it is adapted for vision in both bright and dim light (Brett and Ali 1958). Rods and cones contained within the visual cell layer respond to changes in light by changing their position. The visual cells of smolts are oriented such that they are responsive to ambient light, and not to a circadian clock (Simenstead et al. 1999).

Variances in background illumination cause changes in sensitivity of rod and cone photoreceptors. When light levels change abruptly, the eye has to adapt quickly in order to distinguish objects in the background (Dowling 1967; Riggs 1971). Light adaptation can be explored by determining incremental thresholds: as the background or adapting stimulus impinging on a receptor increases, so does the threshold level of stimulus to which the receptor can respond (Barlow 1972; Blackwell 1972; Dowling and Ripps 1972; Blaxter 1977; Northmore 1977). When the light intensity is above the thresholds levels, the cone cells contract to be near the source of light and the rods elongate away from the light. In contrast, when the light intensity falls below threshold values, the cones expand away from the light and the rods contract towards it (Ali 1959). The amount that a fish's eye must change from one state to another when encountering such a stimulus depends upon the intensity of the introduced light. When the introduced light is bright, the eye will not respond to a dim light, which it may have detected under lower light conditions (Simenstad et al. 1999). This makes it difficult for juvenile salmon to detect predators in the shaded region beyond the brightly lit area.

Over-water structures can cause sharp differences in underwater light intensities, changing the natural lighting regime for both day and night. It is important to understand the behavioral response of salmonids to these light variations. Fish will respond differently depending upon the magnitude of light to which it was exposed before it encountered shade. When the light drops below the rod threshold, schools disband and feeding stops (Ali 1958). Differences in behavior are also species dependent. Species that tend to school such as Chinook salmon, pink, and chum salmon typically react strongly to alarm (such as changes in light intensity). Whereas coho, a non-schooling salmonid, exhibit a less startled behavior (Hoar 1957).

Proposed Criteria and Findings

Proposed Criterion:
To prevent damage to shallow water habitat, piers and/or ramps shall extend at least 40 feet perpendicular from the OHWM.

- Establishes defacto no-wake zone 40 ft from the shoreline.
- A no wake zone of 100 ft from the shoreline is an effective means to protect the littoral zone from erosion and other effects caused by motorized watercraft (Asplund 2000).
- Aquatic plant community, diversity and biomass are negatively impacted by motor boat traffic (Zieman 1976; Murphy and Eaton, 1983; Vermaat and Bruyne 1993; Mumma 1996; Asplund 1997).
- There is no direct link in the literature to the 40 ft dimension. There is substantial evidence that motor boat activity near the shore negatively affects erosion and aquatic vegetation and is therefore a reasonable criterion supported by the scientific literature.

Proposed Criterion:
Piers and ramps shall be no more than 4 feet in width.

- The 4-ft width may minimize the effects of the decrease in light levels below the ramp, and still allow safe access to the dock.
- There is much data regarding fish behavior in shadows and predation interactions under different lighting regimes. In general, predation on juvenile salmonids decreases as light intensity increases (Petersen and Gadomski 1994; Tabor et al. 1998).
- Structures providing darkness are most likely to be selected by smallmouth bass Haines and Butler (1969).
- We found no scientific evidence that 4 ft was the optimum width of a ramp or pier, but there is much evidence that the lighting regime should remain as natural as possible.

Proposed Criterion:
The bottom of the pier or bottom of the landward edge of the ramp shall be elevated at least 2 feet above the plane of OHWM.

- Minimizes the risk of losing the ramp to high flows.

- Allows light to penetrate the surface of the water. The benefits of lighting are well documented both in terms of primary production and predator-prey interactions (Carrasquero 2001).

- We did not find any additional scientific literature specifically addressing this criterion.

Proposed Criterion:
Grating shall cover the entire surface area (100%) of the pier and/or ramp. The open area of grating shall be at least 50% as rated by the manufacturer.
Grating shall cover 100% of the surface area of the float(s). The open area of the grating shall be no less than 50% as rated by the manufacturer.
Nothing shall be placed on the over-water structure that will reduce natural light penetration through the structure.

- Allows light to pass through the ramp and float.

- Juvenile salmon better avoid predators at higher levels of light which suggests that shaded areas around and under docks may reduce juvenile salmonids ability to avoid predation (Peterson and Gadomski 1994; Tabor 1998).

- Migrating juvenile salmon avoid covered areas. They tend to swim around docks, forcing them into deeper water where there is a greater chance of predation (Kemp 2005).

- The cumulative effect of many individual docks limits primary production, reducing phytoplankton and insect populations (Jennings et al.1999; Simenstad et al. 1999; Carrasquero 2001).

- We infer that changing the lighting regime will have an adverse effect on predation of juvenile salmonids. Smallmouth bass, and to a lesser extent northern pikeminnow, are attracted to the cover that over-water structures provide. If over-water structures are constructed in habitat used by juvenile salmonids for rearing or migrating, we expect there will be an increase in predation upon the juvenile salmonids

Proposed Criterion:
Skirting shall not be placed on piers, ramps, or floats. Protective bumper material will be allowed along the outside edge of the float as long as the material does not extend below the bottom edge of the float frame or impede light penetration.

- Lighting issues exacerbated by skirting are noted in the above section.
- Skirting provides a visual barrier that may be used by smallmouth bass to ambush prey.

- We found no literature specifically addressing the effects of skirting.

Proposed Criterion:
Shoreline concrete anchors must be placed at least 10 feet landward from the OHWM and shall be sized no larger than 4 feet wide by 4 feet long, unless otherwise approved by NMFS, USACE, and WDFW.

- The riparian zone holds significant value by providing habitat for aquatic insects, the diet choice of subyearling Chinook salmon in McNary Reservoir (Rondorf et al. 1990).

- Minimal disturbance of riparian habitat should be weighed when deciding upon criteria for determining size and placement of concrete shoreline anchors in order to provide protection for terrestrial food sources.

- We found no discussion in the literature of how shoreline anchors might affect the littoral zone or ESA-listed species.

Proposed Criterion:
Piling shall not exceed 5 inches in diameter. Each over-water structure shall utilize no more than 6 piles total for the entire project.

- Pilings placed in flowing water create low-velocity microhabitats that allow predators such as smallmouth bass and northern pikeminnow to conserve energy by holding in these areas and catching prey as it passes (Peterson et al. 1993).

- Ward et al. (1994) found that offshore wharves supported by pilings did not affect juvenile salmon migration and predation. However, these studies had small sample sizes and took place in low-velocity habitats that contained relatively low densities of predators.

- Reducing the number of pilings reduces the potential for avian predation.

- Noise generated by pile driving is well documented to have damaging effects to fish (Carrasquero 2007).

- Limiting the size and number of piles as well as the seasonal timing of the pile driving is a justifiable criterion to reduce the effects of the piles on fish populations.

Proposed Criterion:
Floats shall not be located in shallow water habitat where they could ground or impede the passage or rearing of any life stage of salmonid. Floats shall be in at least 10 feet of water at all reservoir pool levels including MOP (which is 335 feet above sea level). Depth is measured from the bottom of the landward-most edge of the float.

- The reasons for locating docks in at least 10 ft of water are to reduce erosion of the bottom and shoreline, reduce the suspension of sediment in the water column, reduce damage to aquatic vegetation caused by propeller wash, and to minimize the effects to fish (Asplund 2000; Carrasquero 2001).

- The primary goal of this criterion is to establish a 10-ft minimum depth at a given dock site for which MOP elevation may serve as a general reference. Therefore, it is necessary to define MOP elevation at a given location. The definition of MOP elevation at McNary Dam lacks clarity as a criterion. MOP elevation is 335 ft at McNary Dam. At the Blue Bridge (RM 330), MOP varies from 349 ft at 580 kcfs, to just under 340 ft at 47 kcfs. Flows at this site ranges from 150 to 300 kcfs during the spring and summer. Therefore, pool elevations at the Blue Bridge coinciding with this time vary from 342 ft to 344 ft. The criterion should be defined at each river mile for a given flow, or other similar criterion to give the individual dock owner a clearer reference to measure the 10-ft depth.

- Wave action caused by motorboats can cause erosion of the shoreline and bottom of both rivers and lakes (Asplund 2000). The degree of erosion depends on substrate size and cohesiveness (Nanson 1994). Wakes created by motorboats can cause sediments to resuspend in the water column, reducing water clarity that can potentially alter fish behavior and give rise to algal blooms. This resuspension of sediment is well documented by the USACE (1994) Fox River Chain o' Lakes study in northeastern Illinois, and USACE work on the Mississippi (Johnson 1994). Both of these studies, however, were conducted in bodies of water having very low (or no) velocity and fine silt substrates.

- We reviewed information on substrate and shoreline materials of McNary Reservoir to determine the likelihood of shoreline sediments eroding from motorboat wakes and propeller washes. McNary Reservoir shoreline is primarily composed of alluvium and eolian sands of fine, sandy, loam. Where fine sediments are present, the maximum effects of erosion are observed in water shallower than 3 ft and no effects are observed in water deeper than 8 ft (USACE 1994). A cursory examination of shoreline composition suggested that the shoreline of McNary Reservoir is susceptible to the erosive effects of motorboat traffic, therefore supporting the10-ft depth criterion.

- There is a relatively low proportion of fine sediment in the main channel of the Columbia River. Most of the substrate in the Tri-Cities area is composed of coarse sand and gravel. Sonar surveys conducted by the U.S. Department of Energy showed the amount of fine sediment decreased from 90% at McNary Dam to 51% travelling upstream to Port Kelly. Substrate at the Port of Kenniwick is composed of 4% gravel, 82% sand, 9% silt and 5% clay (Pinza et al. 1992). At the Port of Burbank no samples were collected as the bottom was bedrock (USACE 1993). Due to its high velocity and course substrate, we would not expect motorboat use to contribute to resuspension of sediment in the main channel of Lake Wallula.

- Plant growth may be inhibited where find sediments are present. A large number of studies have demonstrated that aquatic plants grow better and have a greater biomass at sites having less boat traffic (Zieman 1976; Murphy and Eaton 1983; Vermaat and Bruyne 1993; Mumma 1996; Asplund 1997). The detrimental effects of motorboats on aquatic plant communities can be minimized by placing docks in deeper water.

- Eurasian watermilfoil *Myriophyllum spicatum* is an invasive aquatic plant that forms dense canopies that can shade out other vegetation. Fragmentation caused by boat propellers is the primary cause of spreading milfoil from one waterbody to another (Washington Department of Ecology).

- For all species of submerged aquatic vegetation, there is a direct correlation between water clarity and the depth at which the plants will grow (Chambers and Kalff 1985; Duarte 1991; Abal and Dennison 1996; Olesen 1996). Kemp et al. (2004) found that the minimum percent light through water (PLW) required for submerged aquatic plants to survive is between 10-30%. Levels of turbidity as low as 4 and 15 nephelometric turbidity units (NTUs) can interfere with the ability of aquatic vegetation to photosynthesize (Hunter and Wilhm 1984). An increase in turbidity from 0 to 75 NTUs decreased primary production, species diversity, and biomass in a study conducted in the Northwest Territories (McCart et al. 1980). Calculations from another study showed that a turbidity of only 5 NTUs decreased primary productivity by about 3-13% and an increase in turbidity of 25 NTUs decreased primary production of aquatic vegetation by 13-50% in clear-water streams (Lloyd 1987). The turbidity levels in McNary Reservoir in reference to boat use near the shoreline are unknown.

- Turbidity can affect freshwater fish communities in both positive and negative ways (Judy et al. 1984). Buck (1956) observed smaller growth rates, reduced reproduction rates, and smaller populations of fish in turbid ponds. During a study conducted by Bisson and Bilby (1982), juvenile coho salmon avoided water with turbidities of 70 NTUs and above where low light conditions prevented successful foraging. In contrast, increased turbidity can reduce predations rate on juvenile salmon (Gregory and Levings 1998) and improve the survival of migrating subyearling fall Chinook salmon (Smith et al. 2003). Turbidity from motorboat operation will be minimized if docks are built in water that is 10 ft or deeper.

- The 10-ft depth criterion is supported as a means to ensure that docks are not built where smallmouth bass and juvenile salmonid habitats overlap. Construction of docks will attract smallmouth and pikeminnow because these fish prefer structure. By constructing docks over deeper water, the interaction between predators and juvenile salmon can be reduced because juvenile salmon are rearing in shallow areas near shore.

Discussion

The proposed criteria for residential docks and over-water structures specify discrete values such as 10-ft depth, 40 ft from OHWM, 4 ft wide, and 5-in diameters. In general, we could not identify these discrete values in the available literature. However, we found that maximizing depth, minimizing structure such as the number of pilings, and maximizing light levels all contribute to minimizing the negative effects that docks have on ESA-listed salmonids and other aquatic organisms.

We found few studies that directly examine dock use by piscivorous fishes and what effect that has on juvenile salmonids. We cite the large and relatively long-term studies on predation by smallmouth bass, northern pikeminnow, walleye, and channel catfish sponsored by the Bonneville Power Administration. The results of those predation studies were sufficiently compelling to support the start of a bounty program for the northern pikeminnow. The results of sampling in reservoir habitats from these studies are applicable to predator-prey relations in McNary Reservoir because most fish were sampled with electrofishing and beach seining along shores where both of those sampling gears are effective.

An overlap in habitat use between juvenile salmon, smallmouth bass, and northern pikeminnow increases the potential for predation. The current Biological Opinion for the Federal Columbia River Power System states that agencies will work together to develop strategies to reduce non-indigenous piscivorous predation (NOAA 2008). By simply reducing the amount of shade, minimizing the number of in-water structures (pilings), and moving the docks into deeper water, we avoid this potential creation of overlapping habitat that may increase predation on listed and non-listed juvenile salmonids. Specifically, placing docks in 10 ft of water, allowing light to pass through the dock, and minimizing the number and size of piles is reasonable and scientifically supported for waters containing federally listed fish species.

As a result of this review, we have narrowed the complex life histories of eight ESA-listed species of salmonids to a few that are most likely to occur in the nearshore areas of McNary Reservoir. Numerous studies from the Snake River and Columbia River provided a strong collection of information to support our reasoning. The juvenile salmon that will be affected in the nearshore area are the abundant subyearling fall Chinook salmon. We were reluctant to dismiss the potential for deleterious effects on the subyearling fall Chinook salmon simply because they are abundant and not listed under the ESA. The evidence supports the assumption that ESA-listed yearling and subyearling spring Chinook salmon currently occur in the nearshore areas or will use the nearshore areas as tributary populations are restored.

The proposed criteria for docks address several issues not directly related to ESA-listed species, but rather to the nearshore ecosystem. The criteria for structures attempt to minimize effects on lighting, the effects of motorboats on aquatic vegetation, shoreline erosion, and vegetation. We recognize that the reservoir shorelines do not represent pristine riverine habitats to which the juvenile salmonids are well adapted. However, these effects are recognized as widely deleterious to aquatic communities. In general, modification of riparian areas and near-shore littoral zone habitat (i.e., shoreline development) degrades freshwater aquatic communities.

Local habitat modifications (e.g., construction of individual residential docks) lead to changes in fish assemblages, particularly "when many diverse incremental changes have accumulated within a basin over time" (Jennings et al. 1999). Jennings et al. (1999) encourages shore zoning and permitting to consider the cumulative effects of small habitat modifications in addition to local effects of the structure.

Historically, management decisions for the Columbia River corridor have been based primarily on species-centered and site-specific scientific research. There are inherent challenges in managing and restoring a system fragmented by hydropower and other human perturbations. However, there has been a growing trend among prominent scientists, educators, and policy makers to view the river not as a sum of its parts, but as a whole interconnected system. It is important to realize that human-caused activities occurring upstream affect environmental conditions further downstream. This connectivity is a fundamental property of all ecosystems. Management actions that target the whole landscape or ecosystem are unlikely to be socially painless or inexpensive, nor are they likely to provide short-term reward. However, this change of perspective is probably essential for the long-term survival of native species.

In 1980, Vannote et al. (1980) first introduced the concept of 'the river continuum'. This theory states that because a river changes constantly as it moves from the headwaters to the mouth, that it can only truly be understood as a continuum. He saw a river as the equilibrium between physical characteristics such as width, depth, velocity, and temperature change and other biological factors. These factors change constantly, in a predictable manner, as the water flows downstream. More importantly, he recognized that those changes are interrelated. Gregory et al. (1991) subsequently described the dynamic relationship between rivers and streams and the surrounding terrestrial ecosystems that result in healthy riparian zones. In McNary Reservoir, the remaining habitat reflects the fragmentation from the construction of dams and human disturbance (Jager et al. 2001; Quigley et al. 2001; Zabel and Williams 2002).

Due to the effects of hydroelectric dams on salmonid populations, much scientific research on the Columbia River over the past few decades has been conducted on salmonid passage and hatcheries. Biological factors such as feeding, growth, and habitat have received little attention. In a review of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program, Williams (2006) concluded that the current program was unlikely to recover declining salmon and steelhead stocks. Adoption of a salmon life history ecosystem concept as a guiding foundation is needed to recover depressed stocks. This "Return to the River" work is a comprehensive scientific review of the programs intended to address the complex issues of habitat degradation, juvenile survival through the hydrosystem, the role of artificial production, and harvest reform. It is a new conceptual foundation for managing salmon from an ecosystem standpoint in the 21st century.

McNary Reservoir, located downstream of the Hanford Reach, includes the confluence of the Yakima, Walla Walla, and the Snake rivers. The nearshore habitat offers limited habitat connectivity for the abundant fall Chinook salmon and to certain life stages of ESA-listed species of salmon. At the same time, the Tri-Cities are typical of rapid urban growth in the interior West and a need for recreational opportunities on the water. Our review emphasized the proposed criteria and most probable biological responses to those criteria. However, in regards to ESA-

listed salmonid species, it is the interaction of these complex ecological processes from the localized effects of a single dock to the cumulative effects of numerous docks over time that is probably more important.

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Appendix A: Proposed USACE criteria for Dock Design

*Asterisks are placed by criteria for which we were asked to provide assessment.

Lake Wallula/ McNary Pool residential over-water structure design criteria

1. Objectives

- Over-water structure design, construction, and use shall minimize degradation of aquatic, nearshore, and shoreline habitats.
- Over-water structures shall not impede any juvenile or adult salmonid life stage including migration, rearing, and spawning.
- Over-water structures shall not enhance habitats used by potential salmonid predators (esp. fishes and birds).

2. Over-water structure definitions and abbreviations

- A residential over-water structure typically consists of a shoreline anchor, ramp, and float. The structure may also include pile(s) and/or float anchor(s).
- Functional grating is the area that is not covered or blocked by any objects such as framing wood, flotation tubs, etc. The percent of functional grating is in relation to the surface area of the float.
- USACE - United States Army Corps of Engineers, Walla Walla District
- NMFS - National Marine Fisheries Service
- WDFW - Washington State Department of Fish and Wildlife

3. Piers and ramps

- To prevent damage to shallow water habitat, piers and/or ramps shall extend at least 40 feet perpendicular from the ordinary high water mark (OHWM).*
- Piers and ramps shall be no more than 4 feet in width.*
- The bottom of the pier or bottom of the landward edge of the ramp shall be elevated at least 2 feet above the plane of OHWM.*
- Grating shall cover the entire surface area (100%) of the pier and/or ramp. The open area of grating shall be at least 50% as rated by the manufacturer.*

- Skirting shall not be placed on piers, ramps, or floats. Protective bumper material will be allowed along the outside edge of the float as long as the material does not extend below the bottom edge of the float frame or impede light penetration.*

- Shoreline concrete anchors must be placed at least 10 feet landward from the OHWM and shall be sized no larger than 4-feet wide by 4-feet long, unless otherwise approved by NMFS, USACE, and WDFW.*

4. Preservatives

- The dock shall be built with materials that do not leach preservatives or other materials.

- No treated wood of any kind shall be used on any over-water structure (float, pier, or ramp).

- No paint, stain or preservative shall be applied to the over-water structure.

5. Preconstruction and construction activities

- If native vegetation is moved, damaged or destroyed, it shall be replaced with a functional native species equivalent during site restoration.

- Any large wood, native vegetation, topsoil, and/or native channel material displaced by construction shall be stockpiled for use during site restoration.

- No existing habitat features (e.g., woody debris, substrate materials) shall be removed from the shore or aquatic environment.

- Construction impacts shall be confined to the minimum area needed to complete the project.

- The boundaries of clearing limits associated with site access and construction shall be flagged to prevent ground disturbance of riparian vegetation, wetlands, and other sensitive sites beyond the flagged boundary. This action shall be completed before any significant alteration of the project area.

- A supply of sediment control materials (e.g., silt fence, straw bales, coconut fiber COIR bales) shall be available onsite. This action shall be completed before significant alteration of the project area.

- All temporary erosion controls shall be in place and appropriately installed downslope of project activities within the riparian area until site restoration is complete.

6. General

- No electricity shall be provided to or on the over-water structure.
- No boat lifts or watercraft lifts (e.g., jet ski lifts) of any type will be placed on or in addition to the over-water structure.
- Shoreline armoring (i.e., bulkheads, rip-rap, and retaining walls) shall not occur in association with installation of the over-water structure.
- Construction of the over-water structure shall be completed during the in-water work window of December 1 to February 28.

7. Piling and float anchors

- Piling shall not exceed 5 inches in diameter.*
- Piling shall be spaced at least 18 feet apart on the same side of any component of the over-water structure. The pier/ramp and float are separate components.
- Each over-water structure shall utilize no more than 6 piles total for the entire project.*
- All pilings shall be fitted with devices to prevent perching by piscivorous (fish-eating) birds.
- Submerged float anchors will be constructed out of concrete and shall be horizontally compressed in form, by a factor of 5 or more, for a minimum profile above the stream bed (the horizontal length and width will be at least 5 times the vertical height).
- No in-water fill material will be allowed, with the exception of pilings and float anchors (Note: uncured concrete or its by-products shall not be allowed).

8. Floats

- Float components shall not exceed the dimensions of 8 by 20 feet or an aggregate total of 160 square feet for all float components.
- Float materials contacting the water shall be white in color.
- Flotation materials shall be permanently encapsulated to prevent breakup into small pieces and dispersal in water, (e.g. rectangular float tubs).
- Grating shall cover 100% of the surface area of the float(s). The open area of the grating shall be no less than 50% as rated by the manufacturer.*

- Functional grating will cover no less than 50% of the float.*

- Floats shall not be located in shallow water habitat where they could ground or impede the passage or rearing of any life stage of salmonid. Floats shall be in at least 10 feet of water at all reservoir pool levels including MOP (which is 335 feet above sea level). Depth is measured from the bottom of the landward-most edge of the float.*

- Nothing shall be placed on the over-water structure that will reduce natural light penetration through the structure.

- Floats shall be positioned at least 40 feet horizontally from the OHWM and no more than 100 feet from the OHWM as measured from the landward-most edge of the float.

- Project construction shall cease under high flow conditions that could result in inundation of the project area except for efforts to avoid or minimize resource damage.

ATTACHMENT 7

LUC 20.25E.080.N. Moorage Regulations.

Moorage facilities are allowed in the shoreline critical area and shoreline critical area buffer in compliance with this subsection N. The requirements of this subsection N may be modified through a critical areas report, LUC 20.25H.230, except where otherwise noted.

1. New or Expanded Residential Moorage Facilities.

   a. When Allowed. Construction of one noncommercial, residential moorage facility per upland residential waterfront lot or one joint-use moorage facility for two or more adjacent waterfront lots is allowed in accordance with this subsection N. Expansion of any legally established existing moorage facility is permitted only to the extent the expansion complies with the development standards of subsection N.1.b below, and does not cause the moorage facility to exceed, or further exceed, any of the limitations in subsection N.1.b.

      Moorage shall only be permitted within:

      i. Lots created on or after the effective date of the ordinance codified in this section having water frontage meeting or exceeding the minimum lot width required in the applicable land use district;
      ii. Lots created prior to the effective date of the ordinance codified in this section; or
      iii. Nonbuilding tracts platted for the purpose of providing common moorage for a group of contiguous properties.

      For the purposes of meeting the requirements of subsection N.1.a.i above, adjoining property owners may combine their water frontage by mutual agreement recorded with the King County Records and Elections Division and the Bellevue City Clerk. Only one moorage facility is permitted pursuant to such a combined frontage agreement, which may connect with the property landward of the ordinary high water mark at only one location.

   b. Development Standards.

      i. The only structures permitted in the first 30 feet waterward of the ordinary high water mark are piers and ramps. All floats and ells must be at least 30 feet waterward of the OHWM.
      ii. No skirting is allowed on any structure.
      iii. Surface coverage (includes all overwater portions of the moorage structure):
         (1) Moorage facilities serving only one residential waterfront lot shall not exceed 480 square feet.
         (2) Moorage facilities serving two residential waterfront lots shall not exceed 700 square feet.
         (3) Moorage facilities serving three or more residential waterfront lots shall not exceed 1,000 square feet.
      iv. Location, Width and Length Regulations. Docks with configurations that do not include any or all of the elements below shall be subject to the overall length and square footage limitations of this section. No portion of a dock shall exceed four feet in width, unless allowed in this subsection N.1.b.iv.
         (1) Piers shall not exceed four feet wide and shall be fully grated.
         (2) Ramps shall not exceed three feet wide and shall be fully grated.

(3) Ells.
(a) Ells are allowed only over water with depths of nine feet or greater at the landward end of the ell.
(b) Ells may be up to six feet wide by 20 feet long with a two-foot-wide strip of grating down the center; or
(c) Ells may be up to six feet wide by 26 feet long with grating over the entire ell.
(4) Floats.
(a) Floats are allowed only over water with depths of 10 feet or greater at the landward end of the float.
(b) Floats may be up to six feet wide by 20 feet long, with a two-foot-wide strip of grating down the center.
(5) Total Facility Length. In no case may any moorage facility extend more than 150 feet waterward of the ordinary high water mark.

v. Structural Piling Specifications. The first (nearest shore) piling shall be steel, four-inch piling and at least 18 feet waterward of the ordinary high water mark. Piling sets beyond the first are not required to be steel, shall be spaced at least 18 feet apart and shall not be greater than 12 inches in diameter. Piles shall not be treated with pentachlorophenol, creosote, CCA or comparably toxic compounds. If ACZA pilings are proposed, the applicant will meet all of the Best Management Practices, including a post-treatment procedure, as outlined in the amended Best Management Practices of the Western Wood Preservers. Steel piles will be installed using approved sound attenuation measures.

vi. Shoreline Critical Area and Critical Area Buffer Functions.
(1) Existing Habitat Features. Existing habitat features (e.g., large and small woody debris, substrate material, etc.) shall be retained and new or expanded moorage facilities placed to avoid disturbance of such features.
(2) Invasive weeds (e.g., milfoil) may be removed with nonchemical means only.
(3) Shoreline Planting. In order to mitigate the impacts of new or expanded moorage facilities, the applicant shall plant emergent vegetation (if site-appropriate) and a buffer of vegetation a minimum of 10 feet wide along the entire length of the lot immediately landward of ordinary high water mark. Planting shall consist of native shrubs and trees and, when possible, emergent vegetation. At least five native trees will be included in a planting plan containing one or more evergreen trees and two or more trees that like wet roots (e.g., willow species). Such planting shall be monitored for a period of five years consistent with a monitoring plan approved pursuant to LUC 20.25H.210. This subsection is not intended to prevent reasonable access through the shoreline critical area buffer to the shoreline, or to prevent beach use of the shoreline critical area.

vii. Setback. No private moorage or other structure waterward of the ordinary high water mark, including structures attached thereto, shall be closer than 12 feet to any adjacent property line except when a mutual agreement of adjoining property owners is recorded with the King County Records and Elections Division and the Bellevue City Clerk. Excepted from the requirements of this section are boat lifts or portions of boat lifts which do not exceed 30 inches in height measured from ordinary high water mark.

2. Repair and Replacement of Existing Residential Moorage Facilities.

ATTACHMENT 7

a. Certain Repairs Requiring Partial Compliance with Development Standards. Proposals described in this subsection to repair legally established moorage facilities that do not meet the requirements of subsection N.1 above require partial compliance with such requirements, as follows. A proposal includes any and all actions proposed within a 12-month period.

   i. Proposals Requiring Partial Compliance. The following proposals shall require the need for partial compliance with subsection N.1 of this section. If a proposal requires partial compliance, the applicant shall perform one of the improvements listed in subsection N.2.ii below.
      (A) Proposals to replace more than 50 percent of the decking and the above-water decking substructure (e.g., stringers) within the first 30 feet waterward of the ordinary high water mark, or of the existing access ramp, whichever is less; or
      (B) Proposals to replace more than 50 percent of the decking and decking substructure of the entire moorage; or
      (C) Proposals involving the combination of either subsection N.2.a.i.(A) or (B) of this section with a proposal to replace more than two but less than 50 percent of the existing piles.
   ii. Improvements Required. If the proposal requires the need for partial compliance, the applicant may choose one of the following improvements. The improvement shall be completed with the original proposal:
      (A) Reduce of the width of that portion of the facility within the first 30 feet waterward of the ordinary high water mark, or of any access ramp to no more than four feet wide; or
      (B) Fully grate the affected portion of the facility; or
      (C) Remove skirting from the entire facility; or
      (D) Remove existing piles from the first 18 feet of the facility; or
      (E) Enhance the shoreline critical area buffer to meet the shoreline plantings requirements of subsection N.1.b.vi.(3) above.
   iii. Proposals involving replacement of moorage piles shall require full compliance of replacement moorage piles with the development standards of subsection N.1.b.v above.
   iv. Proposals involving replacement of more than 50 percent of the structural piles of the moorage facility shall be considered a new moorage facility and shall comply with the provisions of subsection N.1 above.

b. Other Repairs. Proposals to repair existing legally established moorage facilities where the nature of the repair is not described in subsection N.2.a shall be considered minor repairs and are permitted, consistent with any applicable standards of the Land Use Code, International Building Code, as adopted and subsequently amended by the City of Bellevue, and any other applicable codes or regulations.

ATTACHMENT 8

20.25E.080.E. Shoreline Stabilization, Including Existing Bulkheads.

Shoreline stabilization is allowed in the shoreline critical area and shoreline critical area buffer in compliance with this subsection E. The requirements of this subsection E may be modified through a critical areas report, LUC 20.25H.230.

1. Definitions.

   a. Hard Shoreline Stabilization Measures. As used in this part, “hard shoreline stabilization measures” include: rock revetments, gabions, concrete groins, retaining walls, bulkheads and similar measures which present a vertical or nearly vertical interface with the water.

   b. Soft Shoreline Stabilization Measures. As used in this part, “soft shoreline stabilization measures” include: biotechnical measures, beach enhancement, anchor trees, gravel placement, stepped back rockeries, shoreline plantings and similar measures that use natural materials engineered to provide shoreline stabilization while mimicking or preserving the functions and values of the shoreline critical area.

   c. Shoreline Stabilization Measures. As used in this part, “shoreline stabilization measures” refers collectively to both hard and soft shoreline stabilization measures.

   d. Avoidance Measures. As used in this part, “avoidance measures” refer to techniques used to minimize or prevent shoreline erosion that do not involve modification of the shoreline at the interface of land and water. “Avoidance measures” include vegetation enhancement, upland drainage control, and protective walls or embankments placed outside of the shoreline critical area and critical area buffer.

   e. Technically Feasible. The determination of whether a technique or stabilization measure is “technically feasible” shall be made by the Director as part of the decision on the underlying permit after consideration of a report prepared by a qualified professional addressing the following factors:

      i. Site conditions, including topography and the location of the primary structure in relation to the ordinary high water mark;
      ii. The location of existing infrastructure necessary to support the proposed measure or technique;
      iii. The level of risk to the primary structure, public facility or public use structure or land area presented by shoreline erosion and ability of the proposed measure to mitigate that risk;
      iv. Whether the cost of avoiding disturbance of the shoreline critical area or shoreline critical area buffer is disproportionate as compared to the environmental impact of proposed disturbance, including any continued impacts on functions and values over time; and
      v. The ability of both permanent and temporary disturbance to be mitigated.

   f. Allowed Land Area. As used in this part, “allowed land area” is the land area located within 25 feet of the existing primary structure landward of the ordinary high water mark, or for public and city parks, that land area used for an active recreational use or developed with recreation facilities, including trails, picnic areas, and playfields.

g. Minor Repair. As used in this part, “minor repair” refers to modifications or improvements to an existing shoreline stabilization measure that are designed to ensure the continued function of the stabilization measure by preventing failure of any part of the stabilization measure. A repair that is proposed after a significant portion of the stabilization measure has collapsed, eroded away or otherwise demonstrated a loss of structural integrity is not a minor repair.

2. New or Enlarged Shoreline Stabilization Measures.

a. When Allowed. New or enlarged shoreline stabilization measures shall be allowed only to protect existing primary structures, public facility or public use structures, and allowed land area. Shoreline stabilization measures shall be allowed only where avoidance measures are not technically feasible.

b. Type of Shoreline Stabilization Measure Used. Where a new or enlarged shoreline stabilization measure is allowed, soft shoreline stabilization measures shall be used, unless the applicant demonstrates that soft shoreline stabilization measures are not technically feasible. An applicant asserting that soft stabilization measures are not technically feasible shall provide the information relating to each of the factors set forth in subsection E.1.e of this section for a determination of technical feasibility by the director. Only after a determination that soft shoreline stabilization measures are not technically feasible shall hard shoreline stabilization measures be permitted.

c. Location. Shoreline stabilization measures shall be located at or behind the ordinary high water mark. Soft shoreline stabilization measures may also be located waterward of the ordinary high water mark.

d. Height limit. The height of any new or expanded hard shoreline stabilization measure shall not exceed 30 inches from average grade of actual or existing topography or, if at the ordinary high water mark, the ordinary high water mark; except that bulkhead heights may be increased if approved by the Director if the following criteria are satisfied:

i. Increased height does not negatively impact abutting properties; and
ii. Increased height is necessary to protect the existing primary structure or allowed land area because of:
(1) Slopes of 40 percent or greater at and immediately landward of the ordinary high water mark. In such instances, increased height shall be limited to the minimum height necessary to protect the existing primary structure and allowed land area, or
(2) Extraordinary wave action as demonstrated in a report prepared by a qualified professional. In such instances, increased height shall be limited to the minimum height necessary to protect the existing primary structure and allowed land area or 45 inches, whichever is less.

e. Mitigation and Restoration. Areas of new permanent disturbance and all areas of temporary disturbance within the shoreline critical area and shoreline critical area buffer shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210.

3. Repair and Replacement of Existing Shoreline Stabilization. This section allows repair and replacement of existing legally established shoreline stabilization measures.

    a. Minor Repair. Minor repair is permitted. Areas of temporary disturbance within the shoreline critical area or shoreline critical area buffer are restored pursuant to a restoration plan meeting the requirements of LUC 20.25H.210.
    b. Major Repair or Replacement. Major repair or replacement shall be treated as a new shoreline stabilization measure, subject to the provisions of subsection E.2 above.

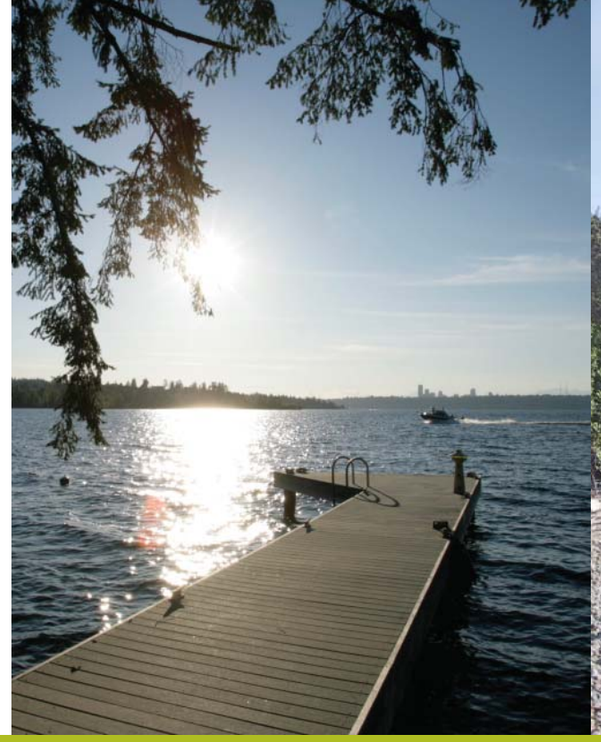
4. Bulkheads shall be designed to minimize the transmission of wave energy to other properties.

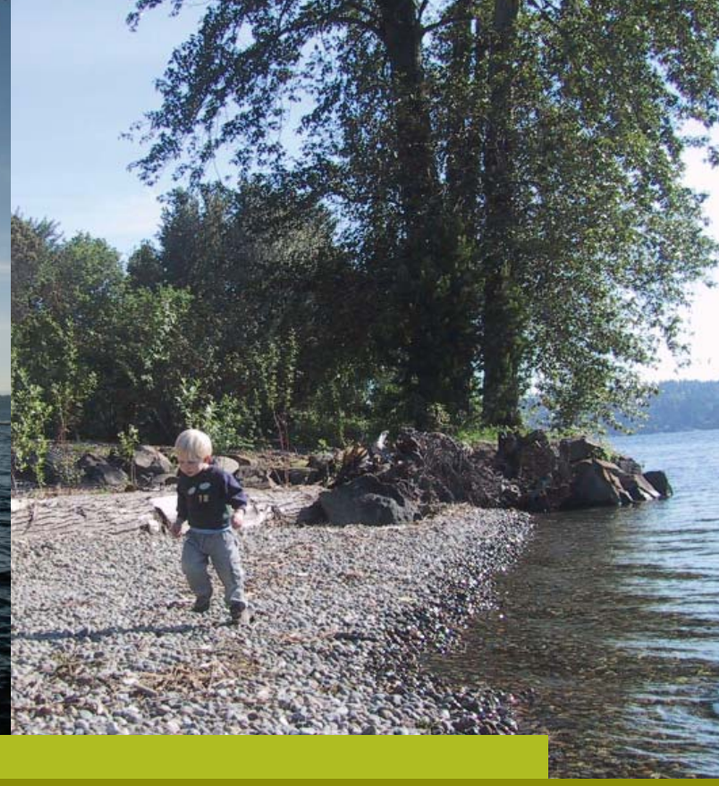
5. Critical Area Buffer Modification. Where an applicant replaces a legally established existing hard shoreline stabilization measure with a soft shoreline stabilization measure or an avoidance measure, the critical area buffer and any applicable structure setback shall continue to be measured from the ordinary high water mark that existed with the hard shoreline stabilization measure. Such ordinary high water mark shall be located by a survey prior to removal of the hard shoreline stabilization measure.

Photo and design: Anchor Environmental

ATTACHMENT 9

Selecting the right approach





Not all of the practices discussed in this guidebook are appropriate for every waterfront parcel. Vegetated buffers and logs can be incorporated into just about any shoreline project, including those that require some form of bulkhead. Slope bioengineering and setting back bulkheads also can be used on most sites. While full beach restoration and beach coves are the most desirable options for shoreline management, they may not be effectively implemented on every site.

In cases where bulkheads serve only to maximize lawn area, they can typically be replaced by a beach with minimal grading and little additional reinforcement. Others cases, such as properties where houses are set back just a few feet from the water or are perched steeply above the shoreline, require some amount of armoring. How can you tell which practices might be the most appropriate for your property?

Your property's potential for green shoreline improvements is determined by a combination of four factors: building setback from the water, nearshore slope moving from your shoreline into the lake, yard slope leading from your house to the shoreline, and the intensity of waves in your area.

"High wave energy" on the decision tree does not include the typical waves experienced along Lake Washington, but rather refers to sites with one or more of the following conditions:

1. Site is adjacent to major boat traffic lane, such as the mouth of Union Bay.
2. Site receives waves that build up over a particularly long fetch (the distance over which waves pick up wind energy).
3. Site receives waves reflected off Highway 520 or Interstate 90.

The decision tree presented here helps evaluate options based on a site's characteristics, but it is not definitive – individual sites may have additional or special characteristics that increase or limit design options.

Green Shorelines Decision Tree

How do I know which options I can consider for my site?

Notes:
The use of plant buffers or logs is a viable option for any site, including those that employ hard engineering such as bulkheads.

Sites with less than a 10' setback are not included on this decision tree, because in most cases they will depend on concrete, sheetpile, or riprap. As noted above, plant buffers still may be appropriate.

1. full beach, beach coves, setting back bulkhead, bioengineering
2. beach coves, setting back bulkhead, bioengineering
3. setting back bulkhead, bioengineering
4. bioengineering