

Puget Sound National Estuary Program

SHORELINE ARMORING VITAL SIGN BASE PROGRAM ANALYSIS

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EXECUTIVE SUMMARY

This report is one of several appendices to the [Shoreline Armoring Implementation Strategy Narrative](#) (Habitat Strategic Initiative 2018). It assesses ongoing programs related to shoreline armoring in Puget Sound and is intended to help regional partners operationalize the individual strategies developed through the collaborative process described in Section 1.2. Participants in this process are described in Section 1.3.

The main body of this report provides a brief overview four regional strategies developed to accelerate progress towards beach recovery goals; existing programs relating to each; identification of opportunities for specific actions, ongoing programs, and innovative models to support implementation of the strategies; and funding options for direct restoration and protection actions.

Appendix A provides supporting information and analysis of individual regulatory and incentive programs. Consistent with National Estuary Program guidance for “base program analysis” (EPA 1993), these Fact Sheets include details about program legal authority, implementing organization(s), funding, strengths, and weaknesses.

REGULATORY PROGRAMS

Table 1 summarizes the four key programs that drive regulation of shoreline armoring in Puget Sound. Lack of political support—manifesting in statutory exemptions, chronic understaffing of programs, and weak enforcement intensity—is a barrier to strong implementation of these shoreline regulations.

Several opportunities to improve regulatory programs are identified in Sections 3 – 6 of this report. These include providing permit reviewers with access to technical experts during permit review and appeals; standardizing review procedures; and allocating resources for compliance inspections. Adequate staffing is a prerequisite for implementation of needed program improvements. Achieving significant improvements in compliance rates would likely require changes to the Hydraulic Code and, potentially, revisions to the Regulatory Reform Act of 1995.

There is some evidence that local jurisdictions are struggling to include permit mitigation requirements sufficient to protect habitat to the extent required under the Shoreline Management Act. Participants in this strategy development process advocated for development of third-party mitigation options to better compensate for impacts caused by armoring. However, the high cost of waterfront real estate is likely a barrier to development of shoreline mitigation sites in Puget Sound. There is currently one federally-approved in-lieu fee program selling credits for shoreline modifications, and the economics of this program element are proving difficult. The price of credits quite high, demand has been very low, and the program has found it extremely difficult to secure properties for marine shoreline restoration. Given the difficulties of implementing third-party programs for approval under the Federal

Rule, local options for funding restoration activities required to satisfy Shoreline Management Act no net loss and/or National Flood Insurance Program Biological Opinion requirements should be explored.

Participants in this strategy development process raised concerns about “grandfathering” that allows for in-kind replacement of existing structures, even when those structures would be prohibited today and the replacement extends the life of the impact with inadequate mitigation. The science is clear that the lower a bulkhead is located on a beach, the more likely it is to affect a variety of ecosystem functions. Prior to implementation of modern environmental laws, structures were commonly built lower in intertidal elevations. Yet when reviewing applications for replacement of existing bulkheads, regulators can add conditions related to construction impacts and encourage—but not require—removal or alterations such as moving structures significantly landward. The incentive strategy described in Section 7 partially addresses this gap in the statutory framework.

INCENTIVE PROGRAMS

Table 2 summarizes several existing incentive programs that are seeking to encourage landowners to choose not to install hard armor on unarmored properties, or to choose alternatives such as removal, landward setback, and soft-shore when replacing existing armor. Incentives offered to homeowners with bulkheads needing a major repair or replacement are an opportunity to significantly improve shoreline processes and address grandfathered structures.

Several technical assistance programs are being deployed with success, but development of financial incentives is a critical next step that should be prioritized over expansion of site visit programs targeting properties with armor. Section 8 evaluates how property tax breaks and low-interest loans could be offered to motivate homeowners to initiate expensive projects. Creation of a revolving loan fund modeled after programs in Maryland and Virginia is a promising option.

The Incentive Strategy highlights the need to develop a plan for securing sustainable funding for incentive programs, and to identify an oversight entity to coordinate programs among regional and local partners. The Marine and Nearshore Lead Organization has acted in this capacity by providing funding, selecting organizations to deliver services to homeowners, and convening forums to discuss lessons learned. However, funding availability ended in 2017.

Several policy questions were raised during the IS development process and they should be resolved before existing incentive programs are further expanded. If homeowners remove a grandfathered bulkhead, should they be allowed to rebuild it if a soft shore replacement does not work? Where armor is removed using public funds, should conservation easements be acquired to protect the restored habitat in perpetuity? Should the region rely on soft shore expertise available in the private sector, or increase the number of licensed professionals within agencies and/or Conservation Districts?

FUNDING AND TECHNICAL SUPPORT FOR IMPLEMENTATION

Table 4 inventories potential funding sources and the types of assistance they provide. A variety of funding sources are available to implement projects and planning, but a long-term funding source for incentive program oversight and coordination needs to be developed.

Engagement with hazard mitigation planners could provide a way to proactively address homeowner concerns about coastal flooding and erosion risks due to rising storm surges, and access new funding streams relevant to the Long-Term Planning Strategy.

Although the Implementation Strategy does not focus on restoration and acquisition investments, funding for this type of work is included in the inventory and Section 14. A few large armor removal projects may be the difference between meeting or not meeting the shoreline armoring Vital Sign indicator target.

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1. INTRODUCTION

The National Estuary Program (NEP) was established to protect and restore the water quality and ecological integrity of estuaries of national significance. The Puget Sound Partnership (PSP) leads the Puget Sound NEP by bringing together partners to mobilize action around a common agenda. PSP focuses the region's collective effort through development of a shared vision and strategy articulated the [Action Agenda for Puget Sound](#). This comprehensive plan helps to efficiently allocate federal, state, and local recovery investments based on a science-driven, prioritized system.

PSP has developed 25 [Vital Signs](#) that track progress toward Puget Sound recovery goals. These Vital Signs represent overarching measures used to communicate the health of Puget Sound and gauge improvements or declines. Each Vital Sign has one or more specific and measurable metrics that specify regional recovery goals. These "indicator targets" include quantitative milestones that reflect the region's commitments to and expectations for significantly improving the condition of Puget Sound by the year 2020.

1.1 SHORELINE ARMORING VITAL SIGN

Shoreline armoring is the practice of constructing bulkheads (seawalls) and rock revetments. Puget Sound shores are intrinsically dynamic. Armor makes them static, disrupting natural processes that supply the sand and gravel needed to maintain beaches. Along some Puget Sound shores, armor must be maintained to protect public safety and existing infrastructure. However, there are many opportunities to remove armor, utilize "soft shore" stabilization techniques (where natural materials offering some flexibility are used in place of hard, rigid structures), and preserve unmodified shores.

The [Shoreline Armoring Vital Sign](#) represents the health of Puget Sound beaches. Indicator targets call for a net decrease in the total amount of armor in Puget Sound over the time period 2011-2020. Recovery goals also emphasize the importance of feeder bluffs (the source of sand and gravel that maintains Puget Sound beaches) and the need to increase the use of soft shore techniques.

Regional progress on protecting intact shorelines and restoring armored shorelines is tracked via permit data. PSP (2017a) reported that this indicator's status is currently below 2020 targets, but some progress has been made:

- Between 2011 and 2017, there was a Sound-wide net increase of 0.8 miles of armor.
- New armoring continues to be constructed at a pace of 0.66 miles per year, but the pace has slowed since 2012.
- Sound-wide net annual removal exceeded installation in 2014 and 2016.
- 5 counties have seen net decreases since 2011.

1.2 IMPLEMENTATION STRATEGIES

As 2020 approaches, progress towards Vital Sign goals has been mixed. Several indicators have made gains relative to baseline conditions, but many others are not showing improvement (PSP 2017a). The U.S. Environmental Protection Agency (EPA), as federal lead for NEP efforts in Puget Sound, identified a need to further focus regional recovery and protection priorities. The [Implementation Strategy](#) is a planning tool developed to provide this focus.

Implementation Strategies (IS) describe outcomes necessary to accelerate progress towards individual Vital Sign indicator targets. They are intended to serve as a road map for aligning opportunities across agencies and programs, provide priorities for the Action Agenda, and guide funding decisions. These Strategies are developed collaboratively with technical, professional, and policy experts and with local and regional input.

Implementation Strategy development follows a PSP-designed process (PSP 2017b). A volunteer **interdisciplinary technical team (IDT)** recruited through a public process provides most of the technical input on what to include, focus on, and recommend as priorities within the IS. This occurs in facilitated workshops where *Open Standards for the Practice of Conservation* planning tools are used to structure group discussion and develop IS products. The strategies and content developed by the IDT are vetted and refined during topical subgroup meetings, a **technical workshop**, and a **partner workshop**. These subgroups and review workshops broaden participation to validate and improve the draft materials before public and external science reviews occur. Participant feedback is intended to improve the accuracy of content, identify additional resources or information available, and receive input from organizations that may bear some responsibility for implementation of the proposed strategies.

A complete Implementation Strategy contains the following elements:

- A summary narrative that summarizes eight major content areas. The narrative identifies and prioritizes approaches for achieving targets; describes strategies, actions, programs, and policy changes associated with each approach; delineates research and monitoring needs; identifies adaptive management opportunities; and estimates strategy costs.
- Three types of *Open Standards for the Practice of Conservation* logic models:
 - A situation analysis that documents the IDT's common understanding of the factors contributing to problems, barriers, and implementation opportunities. This conceptual model is used to help participants decide where and how to intervene.
 - **Result chains** that describe the cause-effect changes necessary to make progress under each identified approach. They define the sequence of steps needed to achieve specific outcomes, and document group hypotheses about how approaches are intended to address identified problems.
 - A schematic overview depicting how the approaches selected by the IDT work together to drive progress towards indicator targets. Priority pathways are also indicated.

- Supporting technical reports/appendices including, but not limited to, an analysis of ongoing programs per NEP guidance for “base program analysis” (EPA 1993); a state of knowledge report synthesizing technical information about current conditions and uncertainties; effectiveness fact sheets; and tables that specify proposed actions to achieve outcomes identified in the results chains.

1.3 DEVELOPMENT OF THE SHORELINE ARMORING IMPLEMENTATION STRATEGY

An IS for the Shoreline Armoring Vital Sign has been under development since early 2017. The process was led by the [Habitat Strategic Initiative](#) (SI), a partnership between the Washington Department of Fish and Wildlife (WDFW) and Washington Department of Natural Resources (WDNR). The Puget Sound Partnership (PSP) and Puget Sound Institute (PSI) provided technical support.

An Interdisciplinary Team (IDT) of [seventeen technical experts](#) represented several perspectives (local government, tribal, state agency, federal agency, port, non-profit organization, private sector, academia) and disciplines (coastal engineering, geology, ecology, fish biology, law, policy, planning, and landscape architecture).

The IDT developed 4 approaches to decrease the rate of armor installation and encourage removal or softening of existing armor.

- **Regulatory Strategy:** Increase and improve regulatory implementation, compliance, enforcement and communication to increase habitat protection and improve opportunities for the restoration of shoreline processes and habitat.
- **Incentives Strategy:** Improve and expand incentives and education for residential property owners to support their efforts to remove hardened shoreline or protect unmodified shorelines.
- **Design and Technical Training Strategy:** Increase and improve coastal processes-based design and technical training to continue to expand technical solutions and capacity.
- **Planning Strategy:** Improve long-term strategic planning to support and connect regional and local partners to develop integrated habitat restoration and protection, transportation, and infrastructure improvement plans.

The Shoreline Armoring IS also acknowledges the importance of continuing investments in direct restoration and protection (i.e., property acquisition) actions.

All IS files can be accessed <https://pspwa.box.com/v/sapubliccomment>. A detailed description of the development process is provided in [Appendix IV.a](#).

1.4 SCOPE OF THIS REPORT

This report is one of several appendices to the [Shoreline Armoring Implementation Strategy Narrative](#) (Habitat Strategic Initiative 2018). It assesses ongoing programs related to shoreline armoring in Puget Sound and is intended to help regional partners operationalize the Implementation Strategy.

The following evaluations began as part of a “starter package” (Habitat Strategic Initiative 2017) prepared to synthesize existing information so that the IDT could begin deliberations with a shared understanding of current conditions. New information received and knowledge developed during the IS development process was added to the starter package content. The base program analysis informed the IS development process, and the IS development process informed the base program analysis. For example, many of the ongoing, completed, and new actions identified in the Implementation Strategy Action Table ([Appendix I.c](#)) were derived from the following program analysis.

This report is based upon:

- Results of several NEP grants, awarded by the [Marine and Nearshore Lead Organization](#) (LO) between 2011-2016, that characterized problems and tested solutions pertaining to shoreline armor in Puget Sound.
- Discussions during IDT meetings and technical/partner workshops. **Expert elicitation is a key tenet of the Implementation Strategy development process.** Generally, participant views cited herein reflect consensus opinion (i.e., multiple individuals raised the issue or there was general agreement among small break-out groups). Where a single individual raised an issue, it is noted.
- Unstructured interviews with program implementers and grant recipients.
- The author’s experience securing regulatory approvals for marine construction projects as a former employee of the Seattle District Corps of Engineers.

The main body of this report provides an overview of each of the 4 strategies plus direct restoration/acquisition; existing programs relating to each; and identification of opportunities for specific actions, ongoing programs, and innovative models to support implementation of the strategies. **Appendix A provides supporting information and analysis of individual regulatory and incentive programs.** Consistent with NEP guidance for “base program analysis” (EPA 1993), these Fact Sheets include details about program legal authority, implementing organization(s), funding, strengths, and weaknesses.

Recommendations provided in this document are derived from previous NEP-funded regulatory effectiveness and incentive work; suggestions made during IDT meetings and technical/partner workshops; and opportunities identified by the author during development of Fact Sheet analyses (Appendix A) and review of pertinent literature.

2. REGULATORY STRATEGY

2.1 OVERVIEW OF REGULATORY PROGRAMS

A complex set of laws implemented at all levels of government requires that multiple permits and approvals are obtained prior to the installation, repair, or removal of shoreline stabilization structures. Local, state and federal agencies have overlapping jurisdiction over the same project. At each level of government, differing priorities and legal mandates determine the specific resources protected and the extent of the protection that is applied.

Four laws and their associated regulatory programs have the greatest impact on shoreline armoring activities in Puget Sound. They are:

- **Shoreline Management Act (SMA)** – This state law requires cities and counties to develop, adopt, and implement local **Shoreline Master Programs (SMPs)** to guide use of shorelines to protect natural resources while allowing for responsible development and public access. The Washington Department of Ecology (Ecology) ensures local programs consider statewide public interests by providing guidelines to local jurisdictions outlining the essential elements their individual SMPs must address. Ecology also reviews some permits issued by local governments. See Appendix A.1 for more information.
- **Hydraulic Code** – This state law was established for the protection of fish life. It requires permits, **Hydraulic Project Approvals (HPAs)** issued by WDFW, for certain activities in or near state waters. See Appendix A.2 for more information.
- **Clean Water Act Sections 404 and 401** – This federal law established a program that regulates the discharge of fill into waters of the United States to protect aquatic habitats and water quality. Section 404 permits are issued by the U.S. Army Corps of Engineers (USACE or Corps), and 401 Water Quality Certifications are issued by Ecology (except on tribal lands). See Appendix A.3 for more information.
- **Endangered Species Act Section 7** – This federal law requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and/or U.S. Fish and Wildlife Service (USFWS) when any action they carry out, fund, or authorize “may affect” a species listed as endangered or threatened. In 2008, NMFS determined that the Federal Emergency Management Agency’s (FEMA) continued implementation of the **National Flood Insurance Program (NFIP)** in Puget Sound “jeopardized the continued existence” of Puget Sound Chinook salmon, Puget Sound steelhead, Hood Canal chum salmon, and Southern Resident killer whales. FEMA was directed to make several specific changes that would stop additional harm to these species and their habitat. One of these involved new development restrictions and mitigation requirements for inclusion in local ordinances relating to floodplain management in FEMA-designated flood hazard areas (which include most Puget Sound shorelines). Local jurisdictions are obligated to implement development restrictions to maintain good standing in the NFIP. These conditions are implemented through local **Floodplain Development Permits**. See Appendix A.4 for more information.

Table 1 summarizes basic information about each of these regulatory programs. Additional details, context, and analysis about the individual programs can be found in the Appendix A Fact Sheets. **Shoreline development is also subject to several other laws, regulations, and requirements.** Relationships between these 4 regulatory programs and other laws (e.g., U.S. National Historic Preservation Act, U.S. Coastal Zone Management Act, Magnuson-Stevens Fishery Conservation Act, and the State Environmental Policy Act, among others) are mentioned in Table 1 and described in the Fact Sheets for the key programs.

This complex governance system is confusing for applicants, regulators, and regional recovery planners/practitioners. Pace (2017) provides a general scenario describing regulatory issues a hypothetical waterfront property owner must consider when undertaking shoreline construction. In the Puget Sound region, the number of permits/approvals a homeowner should obtain for a shoreline stabilization project depends on the location of the proposed activity. Generally, the lower beach elevation of a structure the more regulatory approvals are required. **Figure 1 illustrates the relative locations of agency jurisdictions.** Tidal datum definitions are provided in Appendix B.1.

As illustrated in Figure 1, local Shoreline Master Programs and floodplain rules apply to a larger geographic extent compared to Section 404 and the Hydraulic Code. Counties and cities therefore play a crucial role in preventing further habitat loss. **47 different local governments—12 counties and 35 cities—regulate marine shorelines along Puget Sound.** There is a wide range of factors influencing implementation of local programs, including jurisdiction size, extent of political interference, and available resources (e.g., financial; data availability and data management systems; number of staff and their experience level). Capacity to plan effectively and enforce regulations may also vary significantly at the local scale.

2.2 STRATEGY OVERVIEW

The Regulatory Strategy seeks to increase and improve regulatory implementation, compliance, enforcement and communication to increase habitat protection and improve opportunities for the restoration of shoreline processes and habitat. It consists of 4 elements:

- Evaluate and improve effectiveness of existing regulations
- Compliance monitoring and enforcement
- Increase political support
- Evaluate the need for statutory and policy changes

These elements are addressed individually in Sections 3-6. Note that sub-sections address key intermediate results identified on the regulatory strategy [results chain](#).

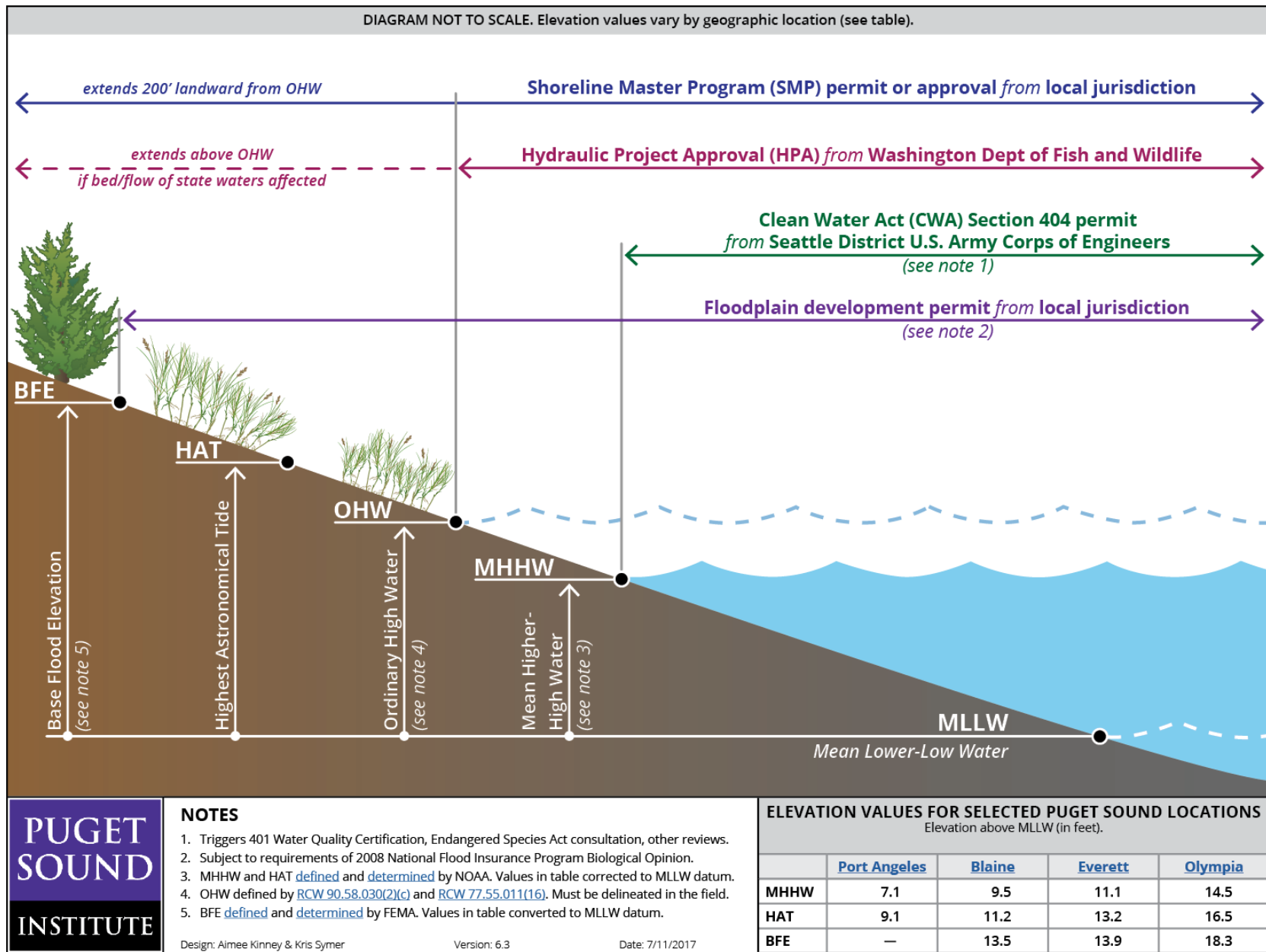
Table 1. Overview of key regulatory programs for shoreline armoring in Puget Sound

	Shoreline Master Programs	Hydraulic Code	Clean Water Act Section 404	Floodplain Ordinances
Implementing agencies	12 counties and 35 cities with Puget Sound marine shorelines and WA Department of Ecology	WA Department of Fish and Wildlife	U.S. Army Corps of Engineers, Seattle District	12 counties and 32 cities with coastal floodplains in the National Flood Insurance Program (NFIP)
Jurisdictional boundaries	Below and 200' landward of the ordinary high water mark (OHWM)	Below the ordinary high water line (OHWL), but can extend landward if bed or flow of state waters affected	Below mean higher high water (MHHW) tidal elevation, as interpreted by Seattle District	Below the Base Flood Elevation (BFE) determined by the Federal Emergency Management Agency (FEMA)
Strengths	<ul style="list-style-type: none"> - 41 of 47 Puget Sound jurisdictions have updated SMPs approved by Ecology - New and replacement armoring requires demonstration of need and soft shorelines where feasible - Many updated SMPs classify shoreline stabilization as a conditional use, which triggers extra review and Ecology approval 	<ul style="list-style-type: none"> - Alternatives analysis required for some new and repair/ replacement bank protection projects - Work underway to improve compliance and enforcement - State permit provides basis for tracking trends 	<ul style="list-style-type: none"> - Endangered Species Act consultation required - Water quality certification from Ecology required - Tribal comments solicited - High fines for violations 	<ul style="list-style-type: none"> - 2008 Biological Opinion (BiOp) development restrictions and mitigation requirements - NFIP's Community Rating System is a strong incentive for protective local land use regulations - Threat of community probation or suspension from the NFIP could be significant deterrent to political interference
Weaknesses	<ul style="list-style-type: none"> - Review protocols for demonstration of need and soft shore feasibility not standardized - Recordkeeping - Lack of compliance data - Program implementation and experience/knowledge of local planners vary widely - Enforcement 	<ul style="list-style-type: none"> - Statute directs WDFW to issue HPAs for single family marine bulkheads that meet criteria - Alternatives analysis cannot be required for most single family residential bulkheads - Staff time for before and after compliance checks with terms of HPA is limited 	<ul style="list-style-type: none"> - Most new armoring is constructed above MHHW so Federal review is not initiated - Jurisdictions where the most new armoring is being installed can be authorized under streamlined Nationwide Permits 	<ul style="list-style-type: none"> - Implementation of BiOp hampered by complexity of requirements and insufficient habitat assessment expertise - Underutilized regulatory tool for coastal shores, due to lack of widespread awareness and poor integration with other programs
Associated regulatory requirements	<ul style="list-style-type: none"> - State Environmental Policy Act - Local building/grading permits - Growth Management Act critical area regulations (in jurisdictions where SMPs not yet updated) 	<ul style="list-style-type: none"> - State Environmental Policy Act 	<ul style="list-style-type: none"> - 401 Water Quality Cert. - Endangered Species Act - Natl Historic Preservation Act - Natl Environmental Policy Act - Coastal Zone Mgmt Act 	<ul style="list-style-type: none"> - Endangered Species Act - FEMA floodplain management criteria - Growth Management Act critical area regulations

Table 1. Overview of key regulatory programs for shoreline armoring in Puget Sound

	Shoreline Master Programs	Hydraulic Code	Clean Water Act Section 404	Floodplain Ordinances
Definitions of repair and replacement	Replacement means 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.	Maintenance means repairing, remodeling, or making minor alterations. Rehabilitation means major work required to restore the integrity of a structurally deficient or functionally obsolete structure. Can include partial replacement. Replacement means the complete removal of an existing structure and construction of a substitute structure in the same general location.	Repair, rehabilitation, or replacement of a currently serviceable structure or fill to its previously existing condition without significant increase in the original structure or fill.	Structural improvements or repairs resulting in greater than a 10% increase in structure footprint require mitigation
Formal enforcement tools	<ul style="list-style-type: none"> - Cease and desist order - Civil penalty up to \$1000/day - Criminal penalty up to \$1000 and/or up to 90 days in jail - Violators liable for damages including cost of restoration - Revocation or revision of permit (may vary by jurisdiction) 	<ul style="list-style-type: none"> - Notice of correction - Seizure of equipment - Civil penalty up to \$100/day - Criminal penalty up to \$1000 and/or up to 90 days in jail 	<ul style="list-style-type: none"> - Civil penalty up to \$10,000/day, with a maximum of \$125,000 - Criminal penalties range begin at 1 year and \$2500 per day 	Jurisdiction subject to probation from NFIP (\$50 fee added to all flood policies) and, if issues not resolved, suspension from NFIP
Timing requirements		HPA must be issued 45 days after receipt of complete application.	USACE usually cannot make a final decision on permit issuance if a state or local permit is pending.	NFIP local jurisdiction must assure that all necessary permits required by state and federal law have been received 44 CFR 60.3(a)(2) et seq.
Training resources	<ul style="list-style-type: none"> - Coastal Training Program - Shoreline and Coastal Planners Group - Regional Planners' Forums - Municipal Research and Services Center 	<ul style="list-style-type: none"> - Marine Shoreline Design Guidelines training and technical assistance (NTA 2016-0380) 		<ul style="list-style-type: none"> - BiOp Workshops - Municipal Research and Services Center

Figure 1. Relationships among tidal datums and key regulatory jurisdictions in Puget Sound



3. IMPROVE IMPLEMENTATION OF EXISTING REGULATIONS

A lesson from regulatory effectiveness grants funded by the [Puget Sound Marine and Nearshore Grant Program](#) (2011-2016) is that there is significant opportunity to improve shoreline protection without changes to laws or regulations (Kinney et al. 2015).

Local SMPs are a focus area for this element of the Regulatory Strategy. As noted in Section 2.1 and Appendix A.1, there are 47 SMPs governing development in Puget Sound local jurisdictions with marine shorelines. In recent years, several reports have provided insights into ways local permit programs could improve review of marine shoreline stabilization projects. Although the themes that emerged from this body of work are based on materials and input from multiple jurisdictions, the extent to which the conclusions summarized below apply to all SMPs will vary.

Partner workshop participants recommended engaging the **Regulatory Innovation Center**, housed at the Governor's **Office for Regulatory Innovation and Assistance (ORIA)**, to help operationalize strategy priorities such as standardizing SMP review processes, improving interagency communication, and developing a multi-agency mitigation strategy. The Regulatory Innovation Center collaborates with federal, state, local, and tribal agencies to improve regulatory processes. The Center offers workgroup facilitation services, mediation, and support to increase help agencies increase transparency. ORIA recently provided similar support for the **Shellfish Interagency Permitting Team**, which was charged with improving efficiency of the shellfish aquaculture approval process (Lund and Hoberecht 2016).

3.1 STAFFING LEVELS AND TRAINING¹

Understaffing of regulatory programs and restrictions on the type of work staff can perform was a frequently-raised concern among IDT and technical/partner workshop participants, as well as in technical reports (Johannessen 2013a, Futurewise 2014b, Barnhart et al. 2015, Kinney et al. 2015, WDFW 2016b).

Implementation of needed program improvements requires adequate staffing. Inadequate staffing appears to be most significant at the local level, and relate to the number of staff, high turnover, and how staff time is allotted. Recommendations to address staffing issues include:

- Encourage jurisdictions to explore additional funding sources for SMP programs, so that operating expenses are not paid for almost exclusively with permit fees. Until long-term funding sources are developed, consider using grant funding to pay for critical work that staff cannot typically bill to permit review on timesheets, such as pre-application assistance,

¹ The Training Strategy developed by IDT focuses on developing and delivering training to project implementers such as contractors and consultants so existing training programs targeting regulatory staff are included here.

enforcement, and training. The Marine and Nearshore LO funded two successful pilot efforts that could be replicated.

- Adkins (2013) indicated that the hiring of a compliance officer for 1.5 years was the most beneficial result of the grant received by Mason County. Paying salary for dedicated enforcement officers is perhaps the most direct way to improve compliance.
- Since training is not directly related to permit review, it can be difficult for jurisdictions that rely on a fee-based funding model to pay for staff time to attend classes. An innovative pilot project to reduce armoring in the Port Susan Marine Stewardship Area used grant funds to reimburse jurisdictions for cost of staff time to participate in training workshop (Johannessen 2013a).
- Allocate more resources to staffing site inspections. As described further in Section 4, baseline compliance monitoring and site inspections before, during, and after permitted construction are critical for effective implementation marine shoreline stabilization regulations (King County 2014, Barnhart et al. 2015, Dionne et al. 2015, Kinney et al. 2015, Windrope et al. 2016, Faghin 2016). Staffing resources at both the local and state levels are not currently sufficient to allow the coverage needed for these inspections (Barnhart et al. 2015, WDFW 2016b).
 - Sharing resources and/or coordinating inspections among regulating entities could be a way to increase the number of site visits during varying stages of project implementation.

Previous investigations concluded that implementers of local SMPs would benefit from additional training and ongoing peer-to-peer communication (Talebi and Tyson 2014, Johannessen 2013, Futurewise 2014, Barnhart et al. 2015). Several existing forums and networks exist and could be expanded:

- The **Coastal Training Program** at the Padilla Bay National Estuarine Research Reserve is funded through NOAA's National Estuarine Reserves Division. Representatives from Ecology, Washington Sea Grant, PSP, and local planners serve on an Advisory Board to oversee program design and development. Their current [course catalog](#) includes classes on coastal processes, shoreline stabilization using vegetation, project design and evaluation, and sea level rise adaptation. Classes are accredited by American Institute of Certified Planners (ACIP), so planners can meet continuing education requirements
- The **Shoreline and Coastal Planners Group** is a collaborative project of Washington Sea Grant and Ecology that provides training and fosters communications between local governments, state agency staff, and others. Free meetings are held a few times a year, and may include field trips, case studies, and discussion of topics such as policy concerns, new technologies, emerging issues, best practices, and lessons learned. ACIP credits are offered. The Group's [March 2016 meeting](#) focused on shoreline stabilization.
- The **Municipal Research and Services Center (MRSC)** is a nonprofit organization that supports local governments across Washington by providing legal and policy guidance on relevant topics. Staff attorneys, policy consultants, and finance experts provide personalized

guidance by phone and email, at conferences and training sessions, and through our extensive online resources.

- Quarterly **Regional Planners' Forums** sponsored by the Planning Association of Washington, the Washington State Chapter of the American Planning Association, and the Department of Commerce provide an opportunity for planners and elected officials to share ideas and receive updates from state and federal agencies whose work may affect land use. Meetings are free of charge and ACIP credits are offered. The Department of Commerce also offers a [Short Course on Local Planning](#).
- **NFIP Biological Opinion Workshops** hosted by FEMA and the Northwest Regional Floodplain Management Association are offered at multiple Puget Sound locations each year. Training covers BiOp requirements and an overview of habitat assessment compliance review. Target audiences includes both local floodplain administrators, other community planners/ permit reviewers, and biological consultants. Acceptable design of shoreline armor is significant part of training.

3.2 GUIDANCE AND TECHNICAL SUPPORT

Another consistent message in meetings and reports was a need for state agencies to support local programs through improved guidance and increased access to technical experts.

- Local planners need additional implementation guidance on:
 - Demonstration of need² (Faghin 2016)
 - No net loss³ (Futurewise 2014a, NWIFC 2015, Faghin 2016)
 - Legal and procedural requirements for enforcement actions (Futurewise 2014c)
- Existing resources to circulate widely and/or build upon include:
 - The [Shoreline Master Program Handbook](#) and [Shoreline Planners Toolbox](#). A NOAA Coastal Fellow working at Ecology is currently developing demonstration of need guidance for inclusion in the shoreline stabilization chapter of the SMP Handbook.
 - The Ecology (1998) enforcement guide for local government administrators
 - The 4-part practical guide series by Futurewise (2014a-d)
 - The [White Paper on No Net Loss](#) prepared by the City of Bainbridge Island's Environmental Technical Advisory Committee
- Local planners also need support from technical experts during permit review and appeals.

² [WAC 173-26-231\(2\)\(a\)](#) directs SMPs to allow structural stabilization measures only where there is a "demonstrated need" to protect a primary structure or legally existing shoreline use from damage due to erosion. See SMA Fact Sheet (Appendix A.1) for more information.

³ [WAC 173-26-186\(8\)](#) requires SMPs to ensure that permitted development does not result in a net loss of ecological functions over time. See SMA Fact Sheet (Appendix A.1) for more information.

- Licensed engineers and licensed geologists with coastal experience to assist with demonstration of need and ways to avoid and minimize geological impacts (Faghin 2016). Application of Marine Shoreline Design Guidelines (MSDG) alternatives analysis tools can encourage consistent application of mitigation sequencing for bank stabilization projects (Kinney et al. 2015).
- Habitat Biologists to assist with identification of biological impacts and ways to avoid and minimize them; this type of collaboration does occur but is limited by staffing levels and workload demands (Barnhart et al. 2015).
- Legal resources and third-party experts for appeals (Futurewise 2014a, Barnhart et al. 2015, Faghin 2016)
- Establishment of mobile regional technical teams has been suggested as a way to address this need for access to credentialed professionals. IDT members reported that **Ecology's Wetland Team** serves as a good example of how such a team could operate.
- The Training Strategy developed by the IDT was designed to help build technical capacity needed to provide critical guidance and expertise to support jurisdictions implement and homeowners comply with regulations.

3.3 PERMIT REVIEW PROCEDURES

Recent projects have explored regulatory program outcomes related to shoreline armoring. This work has identified opportunities to increase program consistency, transparency, and effectiveness through improving permit review procedures.

- Barnhart et al. (2015) recommend developing standardized SMP review and inspection forms, procedures, checklists, electronic tools, and definitions to improve the permit process and subsequent monitoring/tracking.
 - Tools developed for SMP reviewers by Barnhart et al. (2015) as part of the TACT project can serve as a model that can be expanded to other jurisdictions.
 - WDFW created an electronic project and site review form to address some of the procedural deficiencies identified during the TACT project. This form could also be a model for other jurisdictions. Once Habitat Biologists complete the form, it is uploaded to the APPS site and can be viewed by local planners to help with SMP decision-making.
 - Consider making changes to application forms (Futurewise 2014b). Adding fields to input length, width, height, distance from OHW of existing and/or new portions of armoring structures could facilitate input of this information in permit tracking systems (Barnhart et al. 2015). Another option could be developing cell-by-cell application instructions specifically for bank protection projects; this approach was used to support review of [shellfish aquaculture](#) projects (Lund and Hoberecht 2016).

- There is some evidence that local jurisdictions are struggling to include permit mitigation⁴ requirements sufficient to protect habitat to the extent required under SMA (Futurewise 2014a, Barnhart et al. 2015, NWIFC 2015). Barnhart et al. (2015) recommends creating templates or checklists to streamline and guide consistent application of conditions for bank stabilization projects.
 - The TACT project found that permit-exempt bank stabilization projects were not always conditioned in a manner protective of priority habitats and species (e.g., timing windows for forage fish). Quick and easy ways to improve the review of exempt projects (e.g., repair/replacement) should be prioritized, since planners are generally allotted less time to complete the review for these types of projects.
 - SMP staff usually mitigate the impacts to nearshore functions and habitat due to installation of armoring with planting plans; condition is usually to replant disturbed areas with native vegetation (Barnhart et al. 2015). Additional mitigation options should be developed to better address actual impacts (see Section 3.4).
 - WDFW's standard operating procedures for marine bulkhead replacement includes a flow chart illustrating common mitigation requirements. However, local jurisdictions must keep in mind that the Hydraulic Code's focus in fishery resources is narrower than the SMA. HPA provisions alone may not be enough to reach the no net loss standard.
- Another lesson from the TACT project was the need to improve management of permit data. This could help track how decisions are made and the data on which they are based (NWIFC 2015).
 - Some jurisdictions may need assistance to create or update electronic data management systems. Many upgrades to city and county systems have already been completed and can be used to as examples for other jurisdictions (Futurewise 2014a, Dept. of Commerce 2017).
 - Adding and recording consistent tracking metrics is a high priority, to assist with both compliance monitoring and implementation of no net loss requirements.
 - State involvement in these efforts could encourage compatibility of data management systems across agencies and jurisdictions.

⁴ **Mitigation sequencing** is a way for project proponents and regulators to reduce adverse effects. The general approach is to evaluate potential changes or additions to the project scope sequentially: (1) *avoid* impacts by considering practicable alternatives with fewer adverse impacts; (2) *minimize* impacts by incorporating measures to reduce negative effects; and (3) *compensate* for any remaining unavoidable adverse impacts. For SMA, a more detailed 6-step sequence is codified in [WAC 173-26-201\(2\)\(e\)](#).

Impact minimization measures are called different things in different types of permits: “conditions” in SMP and 404/401 approvals; “provisions” in HPAs; and “conservation measures” or “reasonable and prudent measures” during endangered species consultations.

3.4 MITIGATION OPTIONS

Improving mitigation options for shoreline armoring projects was a priority for IDT members and technical/partner workshop participants. Two recommendations emerged from recent technical reports and the IS development process and are discussed here: development of an interagency mitigation manual and development of In-lieu fee programs. These options are not mutually exclusive; mitigation manual could be used to determine mitigation requirements for on-site, permittee-responsible mitigation as well as for off-site, third-party mitigation.

INTERAGENCY MITIGATION MANUAL

Development of a region-wide interagency mitigation manual for shoreline erosion protection could encourage consistency across the multiple jurisdictions and agencies responsible for regulating shoreline development; result in more efficient and predictable permit review; and result in more avoidance, minimization, and compensatory measures incorporated into regulatory approvals (Futurewise 2014c).

A mitigation manual could also provide jurisdictions with easy-to-apply conditions for projects processed as exemptions. Ideally a single comprehensive set of conditions, which could be selected from as appropriate for individual projects, could be developed and agreed upon by all regulatory agencies.

- The 2006 [Interagency Wetland Mitigation Guidance](#) developed by Ecology, Seattle District Corps, and EPA could be used as a model. It is currently being updated.
- Seattle District USACE's [special conditions and mitigation calculator](#) for Regional General Permit 6 (covering structures like piers and floats in Puget Sound) is a good framework for translating impacts to mitigation requirements.
- The City of Seattle recently developed a Habitat Evaluation Procedures model to allow for quantification of shoreline development impacts and mitigation requirements in standardized habitat units.

THIRD-PARTY MITIGATION

IDT members and technical/partner workshop participants also expressed interest in encouraging third-party compensatory approaches in Puget Sound.

The *Final Rule on Compensatory Mitigation for Losses of Aquatic Resources* ([73 FR 19594](#)) includes three mechanisms for providing compensatory mitigation under the Clean Water Act:

- **Mitigation banks** – A site or suite of sites where aquatic resources are restored, enhanced, and/or preserved for the purposes of providing compensatory mitigation for impacts⁵

⁵ Unavoidable adverse impacts which remain *after all appropriate and practicable avoidance and minimization* has been achieved.

authorized by Department of the Army permits. In general, a mitigation bank sells credits to permittees whose obligation to provide compensatory mitigation is then transferred to the mitigation bank sponsor. The operation and use of a mitigation bank are governed by a mitigation banking instrument. Most banks are sponsored by the private sector, and established in advance of impacts.

- **In-lieu fee programs** – Like a mitigation bank, an in-lieu fee program sells compensatory mitigation credits to permittees. However, in-lieu fee (ILF) programs are generally sponsored by government or non-profit entities, and initiated after impacts occur. Site acquisition and construction is funded through the purchase of credits by permit applicants.
- **Permittee-responsible mitigation** – Activities undertaken by the permittee, authorized agent, or contractor to provide compensatory mitigation for which the permittee retains full responsibility.

Third-party approaches—including mitigation banking and in-lieu fee programs—can consolidate what would otherwise be several smaller, lower-quality compensatory mitigation projects into a single project that provides greater overall environmental benefit. For these reasons, the Federal Rule encourages use of third-party options when proposed projects are located within the service area of a Corps-approved mitigation bank or ILF program.⁶

Traditionally, freshwater wetlands have been the focus of third-party approaches. To date almost all ILF programs in Washington mitigate for freshwater wetland fills.

- There are currently three federally-approved ILF programs in the Puget Sound basin: [King County's Mitigation Reserves Program](#) (established in 2012), [the Hood Canal Coordinating Council's In-lieu Fee Program](#) (established in 2012), and [Pierce County's In-Lieu Fee Program](#) (established in 2015).
 - The King and Pierce County programs do not currently offer mitigation credits for any marine sites.
 - The Hood Canal Coordinating Council's (HCCC) [Hood Canal In-Lieu Fee Mitigation Program](#) is currently selling credits for shoreline impacts within their service area.
 - The [Port of Tacoma](#), [Thurston County](#), and City of Seattle are in the process of developing and/or receiving federal approval for ILF programs that would offer mitigation credits for marine sites.
- The South Sound Fisheries Enhancement Group has proposed development of third-party shoreline mitigation sites (C. Newell, NOAA, pers. comm.), but not as part of a formal ILF program approved under the Federal Rule.

There are several significant barriers to the development of federally-approved ILF programs for marine impacts in Puget Sound:

⁶ Seattle District's [May 19, 2016 Special Public Notice](#) clarifies mitigation requirements, including the preference hierarchy for compensatory mitigation.

- Real estate values—The economics of freshwater wetland banking relies on low-cost real estate, as areas susceptible to flooding are generally less desirable. In contrast, marine waterfront is prime real estate and priced accordingly.
 - The Hood Canal program credits are extremely expensive, and demand has been low, with only 2 private sales in 5 years (P. Michak, HCCC, pers. comm.). In addition, the program has found it extremely difficult to secure properties for marine shoreline restoration. Property values are quite high, and owners expect offers to be higher than appraised value in the booming real estate market of recent years. Without the Naval Base Kitsap, the program would likely lack a sustainable client base (P. Michak, HCCC, pers. comm.).
 - Under the Federal Rule, public lands like parks are not eligible as receiving sites since they can be impacted by ongoing human activities (P. Michak, HCCC, pers. comm.). Determining ownership of tidelands has been problematic for the HCCC program.
- Number of sites needed—The Federal Rule does address compensation for marine resources and specifies that “...the location of the compensatory mitigation site should be chosen to replace lost functions and services within the same marine ecological system (e.g., reef complex, littoral drift cell).” Puget Sound has been divided into 744 distinct littoral drift cells (Cereghino et al. 2012). Since receiving would be linked to drift cells, they could be rather small. Several ILF sites would be needed to provide sufficient coverage for a single geographic county. Exporting mitigation to areas too far removed from the resource impacts is a frequently raised concern among program partners (P. Michak, HCCC, pers. comm.).
- State program priorities—Ecology’s Wetland Mitigation Banking Rule ([WAC 173-700](#)) focuses on freshwater wetlands and is silent on ILF programs. Due to staffing reductions, Ecology is no longer involved in authorization or ongoing management of ILF programs. Likewise, PSP previously (circa 2010) had a [Mitigation Program](#) seeking to develop a large network of ILF programs. Two of their 3 pilot ILF programs were eventually approved under the Federal Rule, but the program ended.

Given the difficulties of implementing third-party programs for approval under the Federal Rule, local options for funding restoration activities required to satisfy SMA no net loss and/or NFIP BiOp requirements should be explored. These authorities are complimentary in that they both require that shoreline functions and processes should not deteriorate due to permitted development.

- King County operates a mitigation reserves account geared towards mitigating for Critical Area Ordinance buffer impacts that could be a model for this type of local program (ESA Adolfson 2010 and P. Michak, HCCC, pers. comm.).
- Most shoreline armoring projects occur outside of the Corps’ jurisdiction (see Section 6.3) so 404 permits are not required, and the Federal Rule does not necessarily apply.

3.5 INTERJURISDICTIONAL COMMUNICATION AND COORDINATION

Another concern raised consistently in meetings and reports is interagency coordination. IDT members and technical/partner workshop participants that are regulatory customers expressed frustration at the current lack of effective coordination. Regulators tend to review applications sequentially, with some reporting that several agencies “want to be last in line” and applicants must sometimes re-permit a project due to minor changes made at the behest of a different regulator.

Ideally, permit reviews by all relevant agencies would occur concurrently with clear communication about necessary design elements or needed changes to avoid conflicting requirements from different agencies or departments. This model is elusive because different statutory mandates determine the resources protected and the extent of protection applied, resulting in different project requirements from agency to agency and site to site. Other barriers to effective coordination among regulators include: high workloads; lack of knowledge about other agencies’ authority or process; physical distance between a permit reviewer and their geographic area of responsibility that prevents staff from attending meetings or site visits with other agencies; and high staff turnover that hinders development of interpersonal relationships (Futurewise 2014b). Technical/partner workshop participants reported that *intra*-agency coordination among local jurisdiction departments can also be challenging (e.g., planning, surface water management, roads).

There was clear IDT consensus on the need to improve interagency coordination, but a few members had concerns about the feasibility of some suggested actions. It was noted that Puget Sound agencies have been working on improving coordination for a long time; the [Joint Aquatic Resources Permit Application](#) (JARPA) was provided as an example of progress.

Specific actions and priorities raised by the IDT include:

- Development of a “roundtable” system of coordinated permit review.
 - [Shellfish Interagency Permitting Team](#) Working Group methods were suggested as a model for this approach.
 - Representatives of regulatory agencies had concerns about this idea. Some agencies have statutory time limits that could make this approach impractical, and it could present a logistical challenge given that 47 different local jurisdictions are involved in permitting armoring in Puget Sound.
 - Partner workshop participants noted that this level of coordination is not necessarily needed everywhere and recommended focusing on geographic areas where the most new armoring is occurring and/or where there is the least local capacity.
- Priority coordination needs identified were:
 - Development of automated mechanisms to share issued permits.
 - Improve communication around emergency action procedures.
 - Development of shared mitigation approaches.

- Integrate comments from final reviewers into the process earlier.

Technical and facilitation assistance ORIA's Regulatory Innovation Center could be sought to help develop pilot efforts to address these needs. They recently supported similar efforts by the Shellfish Interagency Permitting Team.

4. IMPROVE COMPLIANCE MONITORING AND ENFORCEMENT

Improving enforcement of existing shoreline regulations was identified as high-priority for IDT members and technical/partner workshop participants. Enforcement is a means to achieve regulatory compliance, and consists of both inspections and sanctions (Shimshack 2014). Recent technical reports have raised concerns about local and state shoreline regulatory programs not identifying potential violations nor imposing penalties commensurate with harm (Johannessen 2013a, Futurewise 2014c, Friends of the San Juans 2014, Kinney et al. 2015, Windrope et al. 2016).

Achieving significant improvements in compliance rates would require policy changes. Political readiness for the following recommendations may be low, and the reason another high-priority element of the Regulatory Strategy is to increase political support (Section 5).

- Allocate resources to staff inspector/compliance officer positions to increase the probability of violation detection and provide more consultation and cooperative assistance to applicants. Many local jurisdictions do not have adequate resources for enforcement, violations are commonly identified through citizen complaints (Talebi and Tyson 2014, MSRC 2017).
 - It is crucial that inspections occur before, during, and after construction to ensure that bank stabilizations projects are implemented as permitted (Dionne et al. 2015, Barnhart et al. 2015). These inspections should focus on bulkhead alignment/footing, because toe elevation is the key factor for minimizing the impact of a bank stabilization structure.⁷ The lower in beach elevation a bulkhead is located on a beach, the more likely it is to negatively affect a variety of ecosystem functions (Dethier et al. 2016b).
- Increase fines for noncompliance (Puget Sound Tribal Management Conference 2017). Changes in the magnitude of penalties are thought to deter violations more than changes in the probability of detection (Shimshack 2014).
 - Revenue from fines should be used to fund compliance officer positions, rather than being deposited into a general fund (Futurewise 2014c).
 - Coordinate enforcement efforts among departments and agencies to improve violation identification and efficiency of subsequent enforcement actions (Futurewise 2014c).

⁷ There is evidence that permitted projects are sometimes built closer to the water (lower elevation) than was specified in permit documentation (Dionne et al. 2015). This may occur when footing inspections do not occur early enough to fix problems, or when field inspectors are not trained in locating OHW (Barnhart et al. 2015).

- Revise to [RCW 43.05](#) to modify how state agencies respond to observed violations. The Legislature's current preference for a voluntary, cooperative, and information-based model of enforcement likely undermines compliance.⁸ Permitting a bank stabilization project can be difficult, costly, and time-consuming for applicants. A relatively easy violation resolution process effectively penalizes those that follow the rules (Futurewise 2014c). Incorporating elements of deterrence-oriented enforcement could discourage unauthorized activities and reduce unmitigated impacts.

Other actions that have been recommended to support compliance goals include:

- Ecology should clarify and communicate SMP compliance monitoring priorities and protocols to encourage consistency across jurisdictions (Talebi and Tyson 2014). Potential tracking metrics could include:
 - Number of dedicated enforcement staff
 - Number of inspections conducted
 - Baseline monitoring surveys completed
 - Number of enforcement actions such as warning letters, notice of violation, fines levied, and structures modified or removed
- Given the disproportionate loss of enforcement personnel after 2007 recession, there is a need for training to rebuild compliance program capacity (Talebi and Tyson 2014, Futurewise 2014c). Field inspection techniques; guidelines for calling in outside agencies; priorities for investigation; what constitutes minor, significant, or critical violations; legal procedures and policies; and collaboration with staff attorneys and county prosecutors should be addressed in compliance trainings (Ecology 1998).
- Conduct rigorous baseline inventories of shoreline structures at the parcel scale and follow-up surveys at regular intervals to improve identification of unpermitted armoring and track overall compliance rates.
 - King County's (2014) survey technique is a model that could be expanded to other jurisdictions.

⁸ During the regulatory reform movement of the 1990s, there was considerable debate over two competing models of regulatory enforcement: deterrence-oriented and cooperative. Three key principals of the deterrence approach are: (1) detection and penalty must be certain, (2) penalties must exceed the benefit of illegal activity, and (3) penalties must be applied swiftly (Futurewise 2014c). Criticisms of this approach include high administrative costs and development of adversarial relationships between regulators and the regulated. The cooperative style emphasizes communication and persuasion; penalties are withheld while information is offered and violators are coaxed towards compliance. Washington's Legislature embraced the cooperative approach as part of the Regulatory Reform Act of 1995 ([Engrossed Substitute House Bill 1010](#), signed into law in May 1995) and agencies follow this statement of legislative intent (see Ecology's [Philosophy and Principles](#) for compliance and enforcement). There is some evidence that the cooperative approach results in significantly lower compliance rates (Harrison 1995, Rechtschaffen 1998), and more recent analysis indicates that an optimal strategy involves a mixture of the two approaches including considerable cooperation but also punitive enforcement for recalcitrant violators (Zinn 2002).

- Talebi and Tyson (2014) recommended investigating ways to improve the efficiency of compliance monitoring. New technologies to capture, geo-reference, and render images are developing quickly and could lead to less labor-intensive techniques for collecting and processing information about built shoreline features.

5. INCREASE POLITICAL SUPPORT

Technical/partner workshop participants identified lack of political will as a major barrier to strong implementation and enforcement of shoreline regulations. Lack of support from elected officials manifests in statutory exemptions, chronic understaffing of programs, interference with individual permit decisions, and weak enforcement intensity.

Participant suggestions for cultivating political will revolved around educating elected officials about the consequences of shoreline armoring and inadequate program implementation.

- Technical/partner workshop participants recommended engaging with PSP’s [Ecosystem Coordination Board](#) (ECB), the [Salmon Recovery Council](#), the [Washington Association of Counties and Cities](#), and the [Coastal Counties Caucus](#) to help encourage political leaders to provide support for regulatory programs.
- Technical/partner workshop participants suggested that when statutory changes are being considered in Washington’s legislature, testimony from local leaders regarding the importance of state programs supports passage of more protective regulations. This approach could backfire, however, as local leaders could just as easily advocate against more protective legislation. This dynamic could potentially be changed with:
 - Expansion of programs like [Watershed Education for Decision Makers](#) offered by Sound Salmon Solutions (a Regional Fisheries Enhancement Group, see Section 14.6).
 - Clear communications about potential consequences of under-resourcing regulatory programs, including risk of exposure to third party lawsuits and changes to National Flood Insurance Program (NFIP) status.⁹
 - Educating the public about failures of the current regulatory system to protect critical habitats from impacts of shoreline armoring. Elected officials need to hear that their constituents support strong protections for Puget Sound shorelines.

⁹ Described in the Appendix A.4 Fact Sheet. When communities are placed on probation, a \$50 surcharge is added to the premium of every policyholder in that jurisdiction. If issues are not resolved, communities may be suspended from the NFIP. This means new flood insurance policies can’t be purchased and existing policies are not renewed.

6. EVALUATE THE NEED FOR STATUTORY CHANGES

IDT members and technical/partner workshop participants discussed several statutory and policy changes that have potential to reduce shoreline armoring in Puget Sound. As summarized below, IDT members did not always reach consensus in support of these changes. However, there was strong consensus about the need to continue evaluating regulatory performance related to recently-updated SMPs, 2015 changes to the Hydraulic Code, and implementation of the Shoreline Armoring Implementation Strategy.

6.1 HYDRAULIC CODE

During 2017 legislative session, several statutory changes consistent with consensus IDT recommendations (as well as Puget Sound Tribal Management Conference “Bold Action” included in the Chinook Implementation Strategy) were sought in [House Bill 1428](#):

- Repeal of the single-family residential bulkhead statute
- Provide WDFW with stop-work authority as part of the civil compliance pathway
- Increase the civil penalty for violations
- Reauthorization to collect fees to cover the cost of processing permits, including an updated HPA fee structure to incentivize pre-application consultation

However, given other complex legislative priorities addressed during the 2017 session no bills related to the Hydraulic Code became law. A similar policy window may open during the next legislative session. Leaders and participants of these IS development processes should prepare for an opportunity to deliver relevant information and mobilize stakeholder witnesses willing to testify about the importance of these changes on a tight timeline.

6.2 SHORELINE MANAGEMENT ACT

[WAC 173-27-040](#) exempts some types of development—including normal protective bulkheads common to single family residences; normal maintenance/repair of existing structures; and emergency construction necessary to protect property from damage by the elements—from some procedural requirements associated with Substantial Development Permits (SDP) issued by local jurisdictions. Recent reports have raised concern that permit-exempt development is not handled uniformly among jurisdictions and may not be receiving adequate site-specific analysis and review (NWIFC 2015, ICF International 2014, Futurewise 2014a). More details are provided in the SMA Fact Sheet (Appendix A.1).

The IDT discussed recommending changes related to exemptions, but the group did not reach consensus. This is because major updates SMA’s implementing regulations occurred in 2003. The revised statute included a requirement and schedule for local jurisdictions to comprehensively update their SMPs, most of which were originally written between 1974 and 1978. By late 2017, 41 of the 47 jurisdictions with Puget Sound marine shorelines have updated SMPs approved by Ecology. Many of the updated SMPs classify shoreline stabilization as a

conditional use in all or some area designations (see Table A.1.1 in the SMA Fact Sheet). This change triggers extra review and offers opportunity for Ecology to approve, deny, or condition the local CUP, thereby negating much of the impact of the exemption.

Almost all IDT members agreed that monitoring the effectiveness of continuing SMP updates and strategy implementation should occur *before* specific changes are proposed. Cities and counties must review and, if necessary, revise their shoreline programs at least once every 8 years after the comprehensive update. Several Puget Sound jurisdictions will be conducting this review in 2019 and 2020. Implementation and effectiveness monitoring could inform these reviews and any resulting revisions.

6.3 SEATTLE DISTRICT'S POLICY ON LIMITS OF JURISDICTION

Under Section 404 of the Clean Water Act, Corps authority to require permits in tidal waters extends to the high tide line. The Act defines **high tide line** as the line of intersection of the land with the water's surface at the maximum height reached by a rising tide, including spring high tides and other high tides that occur with periodic frequency.

Seattle District's interpretation of the high tide line is mean higher high water (MHHW). Use of this tidal datum results in many bank stabilization projects proceeding without federal review. Seattle District is under pressure from other federal agencies, tribal governments, and non-governmental organizations to change their limit of jurisdiction to a tidal datum that includes more area subject to the ebb and flow of tides, such as highest astronomical tide (HAT). The elevation data for Puget Sound cities provided in Figure 1 indicates that the difference between MHHW and HAT is approximately 2 vertical feet.

Lack of data makes it difficult to estimate the number of armoring projects that do not undergo federal review as a direct result of this policy. Comparing the number of 404 permits and HPAs issued for bank stabilization in Puget Sound provides some information:

- Between 2012-2017, Seattle District issued an average of 17 permits annually for new and maintenance bank stabilization (USACE Seattle District 2017a).
- In 2015 and 2016, WDFW issued an average of 165 HPAs annually for new, replacement, and repair marine shoreline armoring (R. Thurston, WDFW, pers. comm.).

It is not known how many of the 90% of projects reviewed by WDFW but not the Corps occurred above MHHW versus below MHHW without 404 reviews. Results of the TACT project indicate that when multiple permits are required for a single project, it is not uncommon for project proponents to apply for one permit but not another (Barnhart et al. 2015).

Several IDT members strongly supported a change to Seattle District's policy on 404 jurisdiction because:

- Individual ESA consultations would be required.
- Provides mechanism for state denial or conditioning.

- Provides opportunity for tribal comment.
- Fines for CWA violations are higher than those for HPA and SMP violations, potentially providing deterrence value. In addition, federal enforcement actions seem to generate larger deterrence effects than state actions (Shimshack 2014).

Other IDT members were concerned that increasing the number of project requiring a USACE permit would make permitting armor removal and soft-shore difficult because of the additional reports, reviews, and comment periods federal review entails. This change would also exacerbate factors thought to contribute to homeowners choosing to avoid permit process entirely (complexity, expense, time required). Unless combined with a significant increase in enforcement, the change would have the potential to increase number of projects built without permits.

Given the complex trade-offs involved, the IDT did not reach a consensus opinion on this issue.

6.4 MITIGATION FOR EXISTING STRUCTURES

Inadequate mitigation requirements for bulkhead repair and replacement permits is a gap identified in recent reports and by several technical/partner workshop participants.¹⁰ The current statutory framework allows in-kind replacement of existing structures (“grandfathering”), even when those structures caused extensive intertidal fill that would be prohibited under current regulations. Regulators can add conditions related to construction impacts and encourage—but not require—removal or significant alterations (e.g., moving structures landward and/or installing soft shore elements).

NWIFC (2015) argues that extending the lifespan of bulkheads also extends their impacts on the geomorphic and ecological processes and, by perpetuating degraded conditions, that this activity should require mitigation. Several technical/partner workshop participants agreed that mitigation for repair/replacement should address more than construction impacts, since long-term effects last on the order of 50 years.

Most regulators involved in the IS development process contend that requiring compensatory mitigation for repair/replacement of existing structures would require statutory changes and a major shift in regulatory practices at the federal, state, and local levels. However, NMFS holds that prolonging the life of an impairment with the replacement of an existing structure is grounds for mitigation. The incentive programs described in Section 7 could potentially address this regulatory gap.

¹⁰ Note that the clear majority of bank stabilization permits are for repair/replacement of existing structures. Between 2007 and 2012 in Kitsap and San Juan Counties, 74% of issued permits were for repair/replacement (Barnhart et al. 2015). In King County, 95% of observed changes in shoreline armoring between 2004 and 2013 were repairs (King County 2014). These trends are expected to continue because a significant number of hard armor structures that have been in place for decades are losing their structural integrity (Johannessen et al. 2014).

7. INCENTIVE STRATEGY

7.1 OVERVIEW OF INCENTIVE PROGRAMS

Several incentive-based programs have been developed to encourage Puget Sound residential landowners to consider alternatives to hard armor.¹¹ **Table 2 provides a summary of these programs; additional information is provided in program Facts Sheets (Appendix A.5-A.10).**

Five types of incentive tools are being used to encourage desired behaviors:

- (1) Education — outreach at events, print and web content, workshops for homeowners
- (2) Technical assistance — site visits, erosion assessments, design services
- (3) Financial incentives — grants
- (4) Permitting assistance — expedited process, special permits, permitting services
- (5) Recognition — signs, certificates

Design and implementation of these tools were based on local market research that provided empirical evidence of specific barriers to changing target behaviors. Key concepts that emerged from research by Keller (2012), Johannessen (2012), and Colehour + Cohen et al. (2014b):

- Landowners do not understand how armor impacts the health of Puget Sound. Many see armor as a desirable, or even crucial, element in protecting shoreline properties.
- Changing behavior will require face-to-face interaction.
- Education needs to come from a trusted source. Landowners are suspicious of government officials and contractors trying to sell them something.
- Outreach activities should occur when landowners generally make decisions about armor, such as immediately after a storm event or when they have recently purchased their shoreline property.
- People want to see and hear about successes with alternatives to hard armor from other shoreline property owners.
- The cost of shoreline construction is a barrier that must be overcome for incentive efforts around armor removal to succeed. Current financial incentives are not adequate.

¹¹ Residential shorelines are the focus of these programs because: (1) approximately 57% of the length of Puget Sound shore is privately-owned residential property (Colehour + Cohen et al. 2014b); (2) most armor removal to date has occurred on public lands; and (3) privately held commercial or industrial lands are often zoned and being used for marine-dependent uses that are not consistent with armor removal or restoration. Opportunities for armor removal along public and non-residential private shorelines are being explored as part of the Planning Strategy.

Table 2. Overview of existing incentive programs for shoreline armoring in Puget Sound

	Implementing organization(s)	Type of incentive(s)	Description
Shore Friendly	<ul style="list-style-type: none"> - Four Puget Sound Counties - Three Conservation Districts - WSU Extension - Futurewise 	<ul style="list-style-type: none"> - Education/outreach - Financial - Technical assistance - Expedited permitting - Recognition 	<p>Grant funded development of a social marketing strategy based on rigorous formative research.</p> <ul style="list-style-type: none"> - Grant funded campaigns underway in San Juan, Kitsap, Mason, and Island - Two 2016 NTA proposals for geographic expansion (Pierce/Thurston and King/Snohomish/Pierce)
Shoreline Armoring Reduction Program (SHARP)	<ul style="list-style-type: none"> - Northwest Straits Foundation - Marine Resources Committees - Conservation Districts 	<ul style="list-style-type: none"> - Education/outreach - Technical assistance - Permitting assistance 	<p>Grant funded planner and landowner needs assessment, workshops, and site visits.</p> <ul style="list-style-type: none"> - Port Susan Marine Stewardship Area pilot complete - Expansion to San Juan, Whatcom, Skagit, Snohomish, Jefferson, Clallam, and Island funded by Marine and Nearshore LO - 2016 NTA proposal for additional workshops, site visits, engineering design services, and permitting assistance (funded)
Conservation District Programs	<ul style="list-style-type: none"> - Twelve County Conservation Districts - Washington State Conservation Commission 	<ul style="list-style-type: none"> - Technical assistance - Financial (proposed) 	<p>Ongoing programs offering technical assistance in support of voluntary natural resource management. Three currently have programs targeting shorelines</p> <ul style="list-style-type: none"> - Three 2016 NTA proposals for expansion of armoring programs
Green Shores for Homes	<ul style="list-style-type: none"> - WA Sea Grant - Islands Trust (B.C.) 	<ul style="list-style-type: none"> - Education/outreach - Expedited permitting - Recognition - Financial (proposed) - Technical assistance (proposed) 	<p>Grant funded development of a green building credits and rating system.</p> <ul style="list-style-type: none"> - San Juan and Mason taking steps to establish program - 2016 NTA proposal for expansion
WSU Extension Programs	<ul style="list-style-type: none"> - WSU Extension offices in Island, Jefferson, Kitsap, Mason, and Skagit, and Snohomish 	<ul style="list-style-type: none"> - Education/outreach - Volunteer training - Recognition 	<p>Shore Stewards, Beach Naturalists, and Beach Watcher programs</p> <ul style="list-style-type: none"> - Two 2016 NTA proposal for expanded Shore Stewards programs related to armoring
Neighborhood Salmon Conservation Easement Program	<ul style="list-style-type: none"> - Friends of the San Juans - San Juan Preservation Trust 	<ul style="list-style-type: none"> - Financial 	<p>Grant funded an acquisition planning project to develop a multiple-landowner easement template that could protect residential habitat along adjacent parcels within one drift cell or pocket beach.</p>

Existing incentive programs are focused on two outcomes: (1) landowners choosing not to install hard armor on unarmored properties; and (2) landowners choosing alternatives to in-kind replacement of existing armor (e.g., removal, soft-shore, setbacks).

The Shore Friendly and SHARP programs have been successful in reaching both individual landowners and their “influencers” (like real estate agents, contractors, and arborists). Grant outputs through 2016 include:

- 23 homeowner workshops with 719 participants
- 19 influencer trainings with 298 participants
- 260 technical assistance site visits with feasibility reports completed (many were to unarmored properties, so the target behavior was no action and results are therefore difficult to track)
- 6 completed armor removal projects; 4 removals in progress; and up to 25 more projects “in the pipeline” and seeking additional funding
- 23 vegetation management and/or drainage projects

7.2 STRATEGY OVERVIEW

The long-term goal of this strategy is to sustain a coordinated group of programs able to educate property owners and motivate voluntary actions for healthy shorelines. This approach builds upon and leverages the substantial progress made to develop incentive and education programs in recent years. Several pilot programs evaluated different approaches to putting the “Shore Friendly” framework (Appendix A.5) into practice while other programs were extensions of existing services. Now that this group of programs has been operating for 4 years, ongoing and careful coordination is needed to ensure that future funding leverages knowledge gained, and resources invested, without duplicating efforts.

Heeding the following lessons from the pilot incentive efforts will help regional partners to build the most beneficial incentive programs:

- Technical assistance is not enough of an incentive for homeowners to remove armor. No projects moved to implementation without financial incentives (see Section 8).
- Geographic overlap and gaps should be managed. As of 2014, 5 shoreline incentive programs were active in San Juan County and none were operating in Pierce County (which had the second highest rate of armor installation of any county between 2005-2015).
- Working at the neighborhood level is important. Residential lots are often small, and removal is not feasible or unduly expensive on for single parcels. Multi-parcel projects are more cost-effective, result in a larger habitat gain, leverage existing peer networks, and likely have more impact on community perceptions about the desirability of armor.
- Selection of an entity to provide program oversight should be considered carefully to ensure stability and longevity. The San Juan County Shore Friendly program was moved from San

Juan County to the San Juan Conservation District after a leadership change in the Department of Community Development.

The IDT identified three near-term priorities for the incentive strategy:

- Expand financial incentives available to homeowners pursuing actions that promote healthy shores.
- Continue and expand homeowner site visit programs.
- Identify sustained funding for existing programs.

These priorities are individually addressed in Sections 8-10. Section 11 addresses an intermediate result that appears on both the regulatory and incentives results chains: streamline permit review for soft shore and armor removal projects. This is an issue raised frequently during the technical and partner workshops, and addressed as part of three Shore Friendly pilot campaigns.

7.3 POLICY ISSUES NEEDING RESOLUTION

Several policy issues arose in final reports for the LO's incentive pilot project grants (Island County 2016, Mason Conservation District 2016, San Juan County 2016, Shore Friendly Kitsap Planning Team 2016, and Northwest Straits Foundation 2016) and during IDT and workshop discussions on the incentive strategy.

There was not enough expertise available during the IS development process to fully analyze nor resolve these questions. However, **these are important topics to resolve as regional partners continue to encourage homeowners to forgo armor, remove armor, and install soft shore stabilization projects.**

- Technical/partner workshop participants noted that that homeowners need a way to distribute risks associated with armor removal. If homeowners remove a grandfathered bulkhead, should they be allowed to rebuild it if a soft shore replacement does not work? Prospective Shore Friendly San Juan participants wanted assurance that they will be able to install another bulkhead in the future if they remove an existing bulkhead and install soft shore that later fails.
- Should homeowners be allowed to trade restoration for other benefits, like relief from lot coverage, buffer, setback, height, or impervious surface requirements? This type of "restoration in trade established in code" has potential to be significant incentive for homeowners at no financial cost to jurisdiction (Futurewise 2014d). These types of trades are currently allowed under code in Kirkland and Bothell.
- Funders need assurance that habitat improvements implemented with public funds are maintained, and not undermined with structural armoring with a new property owner. Where armor is removed using public funds, should easements be required to protect the restored habitat in perpetuity? Or are title restrictions sufficient?

- Should the region rely on soft shore expertise available in the private sector or increase the number of licensed professionals within agencies and/or Conservation Districts. Would increasing the availability of public sector staff ameliorate liability insurance concerns, or are there better ways to spread the risk associated with armor removal and soft shore?
- Soft shore projects require maintenance like periodic beach re-nourishment. Homeowners are likely to need additional permits to perform this maintenance. Are there mechanisms to include such maintenance in original project permits?
- Armor removal and soft shore projects may alter the location of ordinary high water and therefore shift regulatory jurisdictions and required buffers. [RCW 90.58.580](#) does allow relief from some SMP standards and use regulations after restoration projects. It is sufficient? Is there a need for similar language in the Hydraulic Code?

8. EXPAND FINANCIAL INCENTIVES

A key lesson learned from the incentive projects described in Section 7.1 is that development of additional financial incentives is critical and should, in the short term, be prioritized over expansion of site visit programs targeting properties with armor.

Colehour + Cohen et al. (2014b) recognized that the cost of armor removal is a determining variable for landowners and recommended developing financial incentives *prior to* focusing efforts on armor removal/softening projects. Pilot implementation efforts support this conclusion:

- Shore Friendly San Juan participant evaluation comments indicated frustration that there was not actually money available to implement armor removal and soft shore work proposed during site visits (San Juan County 2016).
- SHARP identified many property owners who were willing to consider removing failing bulkheads and installing soft shore alternatives, but unable or unwilling to pay for all the necessary steps (e.g., engineering design, permitting and required cultural/biological assessments, and construction) (NWSF 2016).

The Kitsap County Shore Friendly Phase I effort was the only Marine and Nearshore LO incentive investment that resulted in completed armor removal projects without supplementary grant funding. Six bulkheads were removed and three more were in process by the end of the grant period. This was also the only incentive program to offer direct financial incentives for armor removal.¹² \$5000 mini-grants were reported to be a motivating amount for

¹² Shore Friendly Mason offered mini-grants (\$250-1500) for native plantings and drainage improvements, but assistance provided for prospective removal and soft shore projects consisted of topographical surveys, design construction documents, and permit applications (Mason Conservation District 2016).

homeowners (Shore Friendly Kitsap Planning Team 2016). This cost-share was a fraction of total project costs (\$30,000 to >\$50,000) incurred by the homeowners.

As evidenced by the Kitsap County Shore Friendly effort, additional financial incentives might motivate homeowners to initiate expensive armor removal, setback, and soft shore projects. In addition to cost-share funding, Colehour + Cohen et al. (2014b) identified property tax breaks and low-cost loan programs as tools to address the cost barrier.

8.1 PROPERTY TAX BREAKS

The Washington State Open Space Taxation Act¹³ allows counties to reduce property taxes when owners preserve or restore their land. Tax relief is provided when open space, agricultural, or timber lands are valued at “current use” rates rather than the “highest and best use” typically assessed. This can translate into a reduction in the assessed value for the portion of the property enrolled in a county’s current use program (Faghin and Mateo 2014, Futurewise 2014d).

The Open Space Taxation Act contains broad eligibility guidelines for current use programs and provides counties with the option of developing and adopting a **Public Benefit Rating System** (PBRs) to provide standardized criteria from which the reduction in assessed value can be calculated. A PBRs clearly defines program enrollment criteria and prioritizes benefits emphasized by the community, allowing for more objective and transparent assessments (Faghin and Mateo 2014). PBRs enrollment and associated tax savings are based on point systems developed by individual counties; these systems can differ widely from county to county (Faghin and Mateo 2014, Futurewise 2014d). Points are awarded for qualifying resource categories (e.g., fish/wildlife habitat, geological hazard, aquifer protection, flood storage, riparian buffers not required by regulations, recreation access, etc.) and some systems provide bonus points for restoration activities or conservation/historic preservation easements. Generally, a minimum rating is needed to enroll in a current use program. The higher the public benefit rating, the higher the level of tax relief awarded. All but three Puget Sound counties — Mason, Skagit, and Snohomish—have established PBRs to guide their current use programs.

In 2013, the [Puget Sound Ecosystem Coordination Board](#) (ECB) commissioned a study on the Open Space Taxation Act and how it could be applied to incentivize bulkhead prevention and removal. The resulting report, Faghin and Mateo (2014), evaluated barriers to utilization of current use programs and opportunities for improvement based upon case studies of implementation in three counties. Mason County provided an example of application in a non-PBRs community, while King and Whatcom are communities with PBRs programs.

¹³ [RCW 84.34](#), rules at [WAC 458-30](#). **Open space** includes land that, if preserved in its present use, would conserve important scenic, historic, recreation, and natural resource values.

Report findings and recommendations for potential modifications were discussed by the ECB and [Puget Sound Leadership Council](#) in May 2014. Board and Council members agreed not to pursue legislative changes to the statute (since modifying definitions to specifically address shoreline armoring issues would affect only 3 counties without PBRs); that this type of financial incentive should be paired with technical assistance incentives; that outreach about these programs should target the most ecologically valuable land; and that the Marine and Nearshore LO should provide funding to develop/implement shoreline armoring incentives (PSP 2014).

Since 2014, technical assistance incentive programs have been developed and the importance of financial incentives for homeowners has risen to the forefront. The following recommendations from Faghin and Mateo (2014) should be revisited:

- Conduct an analysis of costs and benefits associated with current use programs, particularly related to tax shift (increased tax burden on properties within the taxing district that are not enrolled in the program).
- Work with PBRs counties to encourage modifications to existing priority resource categories and numerical ratings to more effectively incentivize the protection and restoration of shorelines. Model shoreline-related PBRs provisions, largely drawn from King County's system, are provided in Faghin and Mateo (2014). Recommended changes include:
 - Removing minimum size requirements to encourage participation in urban areas with small lots. Some counties require that the enrolled area be >5 acres.
 - Addition of resources common along marine shoreline properties. For example, feeder bluffs, embedded large woody debris, marine riparian zone, intertidal vegetation, and spawning beaches.
 - Modifying point systems so that tax relief is commensurate to the magnitude of restoration work conducted by the homeowner. Where PBRs programs provide bonus points for restoration, planting native vegetation and bulkhead removal may receive the same number of points.
 - Modifying point systems to award significant bonus points where easements are in place to provide permanent protection. A recognized limitation of current use programs is the property owner's ability to withdraw at any time.
- Raise awareness of current use programs among property owners and county staff.
 - Consider training assessors and current use staff on the program's potential for shoreline conservation as part of Washington Department of Revenue's annual current use training.
 - Since the application process can be confusing and burdensome, consider adding support for landowners navigating the process to existing technical assistance programs.

8.2 LOW-COST LOANS

The cost of marine shoreline construction is quite high, so it is thought that providing low-cost loans may help encourage homeowners to implement alternative shore stabilization projects. Creating a loan program could be an especially powerful mechanism for managing

replacements of existing structures—a recognized weakness of existing regulatory programs. Homeowners with a failing bulkhead at the end of its useful life would likely consider a loan with favorable terms as an attractive alternative to paying out-of-pocket or with standard financing. A loan program could be structured to require approaches (e.g., setback, soft-shore, removal) that cannot be mandated under current regulations.

The Maryland Shore Erosion Control Construction Loan Fund is an ideal model to emulate (Faghin and Mateo 2014, Futurewise 2014d). The Maryland program is a **revolving loan fund** (RLF), where seed money capitalized a fund used to make loans and subgrants. This fund is replenished as loans are repaid, resulting in ongoing financing for program administration, subgrants, and new loans. A major benefit of RLFs is that they are not dependent on annual legislative appropriations or recurring grants.

The Maryland RLF has been operating for over 40 years with steady demand for financing assistance (Otts and Bowling 2013). It was created in 1971 to provide interest-free loans or grants to property owners and local governments for shore erosion projects. Since 1997, the program has focused its resources on nonstructural techniques and no longer finances structural erosion control. On average, the program receives \$600,000-\$700,000 in loan repayments annually and funds 15-20 projects a year (Otts and Bowling 2013).

If development of a shoreline RLF for Puget Sound is pursued, the following steps are necessary:

- Investigate level of interest among homeowners to determine if there is demand for this type of program. Otts and Bowling (2013) found that some RFL programs are underutilized because applicants prefer to apply for grants when available.
- Identify a source of funding for capitalization. The [Clean Water State Revolving Fund](#) (CWSRF) managed by Ecology, and capitalized annually via EPA grant, may be an option. Statute directs Ecology to give priority consideration to projects referenced in the Action Agenda for Puget Sound.¹⁴ In 2016, the Virginia Department of Environmental Quality began a new [Living Shorelines Loan Program](#) capitalized by the Virginia CWSRF.
- Identify an entity to administer the program(s) and service the loans. State agencies, local jurisdictions, special purpose districts (e.g., Conservation Districts), and Tribes are eligible to administer this type of program. A [Regional On-Site Sewage System Loan Program](#) for Puget Sound homeowners with failing septic systems was established in 2016. Ecology administers the program and Craft3, a non-profit Community Development Financial Institution (CDFI), services the loans.
- Develop program guidelines, including priorities and criteria for project selection. EPA (2008) provides useful information on developing, administering, and operating an RFL program. Outputs of the Planning Strategy would support this process.

¹⁴ [RCW 90.50A.080\(1\)\(b\)](#) per [33 U.S.C. §1383\(c\)\(6\)](#)

Tax-exempt nonrecourse revenue bonds could be another mechanism for funding a loan program, but establishment of this type of program would likely require action by the Washington State Legislature (Futurewise 2014d).

9. CONTINUE AND EXPAND HOMEOWNER SITE VISIT PROGRAMS

The IDT and technical/partner workshop participants agreed it was important to continue delivering incentive programs that focus on homeowner support (e.g., technical site visits, design assistance, permitting assistance, and financial support for projects).

Specific suggestions from pilot efforts, recent reports, and technical/partner workshop participants include:

- Identify an oversight entity to coordinate incentive programs among regional and local partners (Faghin and von Reis Crooks 2015).
 - The Marine and Nearshore LO has provided funding and selected organizations to deliver services to homeowners, but LO program funding ended in 2017.
 - The Planning Strategy should help prioritize where incentive investments should be made and enhance regional coordination/communication among implementers.
- Homeowners considering armor removal and/or installation of soft shore protection should be made aware of project cost and complexity upfront. The Shore Friendly Kitsap Planning Team (2016) recommended creating a factsheet with a step-by-step overview and process timeline so participants know what to expect.
- In interviews with homeowners who had installed soft shore protection, von Reis Crooks (2015) found that maintenance was a frequent topic of concern. Some homeowners expressed frustration that gravel or logs they paid for were shifting off their property. Technical assistance provided to homeowners should include specific guidance on what to expect after installation, the frequency of maintenance required, and the likelihood that they will need additional permits to perform this maintenance. An unnamed expert interviewed by von Reis Crooks (2015) suggested describing maintenance needs for soft shore projects like maintenance needs for a garden.
- Consider adding bulkhead setbacks as a target behavior. Dethier et al. (2016a) observed that physical and biological impacts of armoring are related to the elevation of the structure. More negative impacts occurred at sites located at lower elevations. Dethier et al. (2016b) recommended that when replacing shoreline stabilization structures, they be moved higher up the beach to reduce ecological and geomorphic impacts. Of the incentive programs evaluated here, only Green Shores for Homes specifically addresses bulkhead setbacks.
- Technical/partner workshop participants suggested that expansion efforts include development of resources to facilitate realistic conversations with landowners about long-term risks associated with sea level rise, adaptation options (elevating homes, moving homes away from the shore), and opportunities for disaster mitigation buy-outs.

Incentive efforts that target bulkhead repair/replacement projects are particularly important because of their relationship with an identified weakness of regulatory programs: the grandfathering of structures that would be prohibited today. Prior to implementation of modern environmental laws, structures were commonly built lower in intertidal areas. Federal, state, and local regulations allow for in-kind replacement of existing structures, even when a new structure would not be allowed in that location under current law. Since regulatory programs allow in-kind replacement, incentive programs that encourage removal, setbacks, and softening would address this regulatory gap.

10. IDENTIFY SUSTAINED FUNDING

The shoreline armoring incentive programs described in Section 7.1 were largely funded through NEP grants and lack a permanent funding source. The IDT and technical/partner workshop participants identified development of a sustainable funding strategy as a priority need.

Faghin and von Reis Crooks (2015) classified a few different types of costs associated with shoreline technical assistance programs. **Program funding** covers administration (office space, staff, equipment, marketing materials) and implementation (outreach, site visits, feasibility reports by licensed geologist or engineer, and permitting assistance). **Project funding** covers engineering design and construction. Below is information on past program/project costs, from Faghin and von Reis Crooks (2015) and 2016 NTA proposals for the SHARP and Shore Friendly programs, to characterize the magnitude of investment sought.

- Site visit – \$700
- Feasibility report – \$3,200 - \$7,250
- Permitting assistance – average \$8,400
- Engineering design – average \$40,000¹⁵
- Construction – \$30,000 - \$50,000+ for small projects and up to \$400,000 - \$500,000 for larger projects

To date, most program funding has come from the Marine and Nearshore LO. Few other sources of funding provide as much flexibility for program development as NEP and geographic funds. There are comparatively more potential sources of project funding.

Technical/partner workshop participants recommended the Habitat SI and PSP work with Puget Sound's Leadership Council and Ecosystem Coordination Board to investigate and develop

¹⁵ NWSF (2016) indicated that the cost of Conservation District engineering staff is much lower than private sector, but availability/capacity is limited.

alternative revenue sources for program support. The following suggestions to diversify funding for incentive programs and projects and projects are derived from review of existing reports and technical/partner workshop input:

- Form shoreline protection districts or a Puget Sound basin improvement district to generate revenue (Evergreen Funding Consultants et al. 2014).
- Explore ways to encourage additional private funding for Puget Sound recovery. Nongovernmental organizations like tax-exempt nonprofits can generally access private donations more easily; other NEP programs housed in state agencies have created nonprofit arms to conduct fundraising activities (EPA 2005).
 - In Maryland, program funding is provided on an annual basis through the [Chesapeake Bay Trust](#) (Faghin and von Reis Crooks 2015). This Trust is funded through proceeds from “Treasure the Chesapeake” license plates; proceeds from a donation option on the Maryland state income tax form; private foundation grants; federal, state, and local grants; and business/citizen donations (CBT 2017). Creation of the Trust did require an act of the Maryland legislature (Faghin and von Reis Crooks 2015).
 - PSP’s authorizing legislation provides legal authority to establish a similar type of trust. [RCW 90.71.230\(f\)](#) allows the Leadership Council to: *“Receive such gifts, grants, and endowments, in trust or otherwise, for the use and benefit of the partnership to effectuate the purposes of this chapter.”*
- Develop a Puget Sound RFL program (as described in Section 8.2) to enhance project funding by shifting a larger percentage of project construction costs from taxpayers to private property owners. The Maryland Shore Erosion Control Construction Loan Fund is a significant source of project funding for shoreline activities in Chesapeake Bay.
- Explore the feasibility of developing a third-party mitigation program, like King County’s Mitigation Reserves Account, where purchase of credits would provide project funding (as described in Section 3.4).

11. STREAMLINE PERMIT REVIEW

Several technical/partner workshop participants commented that obtaining permits for soft shore and armor removal projects can be just as difficult and time-consuming as permitting armor installation. The Shore Friendly Kitsap Planning Team (2016) found that during Phase I implementation, existing requirements for restoration permitting were surprisingly restrictive, unclear, and varied.

Some IDT members and many technical/partner workshop participants advocated for development of special permit processes within or across regulatory agencies that address the specific needs of restoration projects. However, other participants identified barriers to streamlining permit review:

- Defining what qualifies as “restoration” can be problematic. As illustrated by the variety of definitions for soft shore protection techniques in Appendix B.2, many of these projects are hybrids occurring on a continuum without a bright line between “hard” and “soft.”

- Green Shore for Homes has been suggested as a potential tool to identify projects that should qualify for special permitting consideration.
- Armor removal and softening projects can be extremely complex and may warrant comprehensive evaluation at the permit stage (Ecology comments on *NWIFC Report on Shoreline Armoring* in PSP 2015a). Consequences of reduced stabilization could include impacts on neighboring properties, utilities, and public safety. Restoration of a shoreline often requires substantial changes to other aspects of a site. For example, altering the location of the shoreline can shift regulatory jurisdictions and required buffers (as described in Section 7.3).
 - The Training Strategy is intended to improve the performance of alternative shore protection techniques. Consultant trainings may result in better geotechnical reports and allow regulatory reviews to proceed more smoothly.

PERMIT LIAISONS

An alternative approach could be to fund designated permit liaison position(s) as part of shoreline incentive programs and/or larger regional restoration program. Two types of liaisons would impact project permitting in different ways:

- A liaison could provide application assistance to guide applicants through the permit process, track permit submittals and approval status for individual projects, and work with regulators/applicants to coordinate information requests. Direct assistance (e.g., preparing JARPA) could potentially be provided.
 - This approach was recommended by the Shellfish Interagency Permitting Team, because development of a single coordinated shellfish permit was determined to be infeasible (Lund and Hoberecht 2016).
- A liaison placed within a regulatory agency to expedite review of applications submitted by the funding program. For example, the [WSDOT Environmental Liaison Program](#) provides federal and state regulatory agencies with funding to hire staff that reviews only WSDOT projects. Under this approach, applications are not affected by large backlogs and reviews can be completed significantly faster than normal.

ISSUES FOR BEACH NOURISHMENT PROJECTS

Beach nourishment is the component of soft shore stabilization projects most likely to complicate project permitting. Beach nourishment materials are ideally placed over a broad area of a beach profile—mid-intertidal to backshore is common for Puget Sound—because this allows for less redistribution of material and greater longevity (Johannessen et al. 2014).

However, placing nourishment material in lower elevations triggers permit requirements that a traditional bank stabilization project would not otherwise have:

- [WAC 173-26-231\(3\)\(c\)](#) specifically allows the placement of fill below the ordinary high water for beach nourishment. However, if the purpose is bank stabilization and not ecological

restoration the project would require a conditional use permit (CUP). This complicates SMP approval in jurisdictions where shoreline stabilization is an approved use.

- Placement of fill below mean higher high water put a project into USACE jurisdiction. Obtaining a 404 permit is a complex and lengthy process (see Fact Sheet in Appendix A.3), and may deter project proponents from incorporating beach nourishment into their design
 - The [Puget Sound Federal Task Force](#) Shorelines Workgroup is exploring options to improve coordination and the permitting process for armor removal and soft shore projects. A Regional General Permit and/or programmatic ESA Section 7 consultation for beach nourishment in Puget Sound could help address this disincentive.

12. DESIGN AND TECHNICAL TRAINING STRATEGY

Several recent investigations concluded that existing geological and engineering technical support may not be sufficient to meet demand for assistance, and recommended holding workshops for contractors and consultants (permit, excavation, building, landscaping, geo-tech) to train them in emerging alternatives to hard armoring (Colehour + Cohen et al. 2014, (Faghin and von Reis Crooks 2015, Barnhart et al. 2015, Faghin 2016).

The Design and Training Strategy developed by the IDT addresses this need by increasing and improving coastal processes-based design and technical training to continue to expand technical solutions and capacity. The outcome of this strategy is improved access to designs, guidance, and training necessary to design and implement projects protective of the environment.

Improved designs, guidance for implementation, and training of contractors and consultants will support other strategies. Technical expertise is needed to continue and expand existing incentive programs, as well as to support the preparation and review of geotechnical assessments required during project permitting.

The near-term priorities for the Training Strategy are largely research-based:

- Compile and analyze existing monitoring information on implemented removal and soft shore projects to improve designs and site selection.
- Develop guidance to provide practitioners with a step-by-step approach from design through implementation to improve implementation of removal and soft shore projects.

The Implementation Strategy's State of Knowledge Report ([Appendix II.b](#)) provides information about available monitoring data and ongoing/proposed research efforts that would support these priorities.

After these near-term priorities are addressed, the next step would be development of a programmatic framework for a technical training program. The Implementation Strategy does

not identify who will develop and deliver these trainings. However, the following existing programs and courses were identified as potential models, curricula, or delivery mechanisms for implementation of technical training for designers and contractors:

- The [Coastal Training Program](#) at the Padilla Bay National Estuarine Research Reserve (described in Section 3.1) offers courses on “Puget Sound Coastal Processes, Shoreline Modifications, and Beach Restoration” and “Shoreline Management and Stabilization Using Vegetation.”
- The [Landscapes on the Edge](#) course offered by Greenbelt Consulting and UW Botanic Gardens provides guidance and instruction on how to better initiate, design, and implement successful landscape and restoration projects on upland buffers, shorelines, steep slopes, and beaches. This course is approved for continuing education credits by several horticulture and landscape architecture professional societies.
- The University of Washington offers several [Professional and Continuing Education Certificate Programs](#). Their [Wetland Science and Management](#) was suggested as a model for a potential beach training and certification course.
- USACE has partnered with Texas A&M University to develop a curriculum to support their [Engineering with Nature](#) initiative.
- The Washington Stormwater Center’s [Low Impact Development Certificate Program](#) was identified as a good model for a modular training approach.
- Technical trainings were delivered as part of some Shore Friendly pilot efforts, including courses for Conservation District staff and arborists/landscaping professionals.
- WDFW received funding to develop workshops and training materials for practitioners applying the [Marine Shoreline Design Guidelines](#) to project sites.
- Green Shores for Homes has offered training for landscape designers, technicians, and planners (see Appendix A.8). No other incentive program is pursuing development of a list of accredited professionals.

13. LONG-TERM PLANNING STRATEGY

IDT members determined that it is important for regional and local planning efforts to consider how current land-use and shoreline permitting decisions will need to change as sea level rises and existing infrastructures age. The resulting Planning Strategy intends to improve long-term strategic planning by supporting and connecting regional and local partners to develop integrated restoration, protection, transportation, and infrastructure improvement plans. This strategy describes the planning efforts, research questions, and monitoring that should be in place today to effectively reduce armor impacts in the future across all land-use types.

The near-term priorities for the Planning Strategy are largely research-based:

- Complete mapping of Puget Sound shoreline attributes using standardized methods.

- Improved quantification of shoreline armor impacts on the Puget Sound nearshore ecosystem.
- Identification of vulnerable and aging infrastructure and unarmored shorelines vulnerable to armor installation.

The Implementation Strategy's State of Knowledge Report ([Appendix II.b](#)) provides information about existing mapping and research efforts that would support these priorities.

The programs described below relate to a fourth priority of the Planning Strategy: leveraging successful case studies that highlight non-restoration-focused projects that resulted in removal shoreline armor to scale them up into regional programs while enhancing coordination among large partners.

Potential sources of technical assistance, funding, and implementation potentially able to support integrated land-use (shoreline, critical area, and hazard) and capital project development planning are described below.

13.1 TRANSPORTATION PLANNING

The IDT and technical/partner workshop participants agreed that a top priority for the long-term planning strategy was to facilitate moving roads away from shorelines where feasible.

The ECB's most recent funding strategy recognized that highway spending should be synchronized with watershed planning to ensure investments are consistent with restoration priorities (Evergreen Funding Consultants et al. 2014). A potential barrier raised by participants is conditions associated with federal funding for highway repair that prohibit moving roadways. Changes to standard design and construction specifications may also be needed.

The Washington State Department of Transportation (WSDOT) and Federal Highway Administration (FHWA) have begun work to evaluate infrastructure vulnerabilities to climate change. WSDOT (2011) documented early mapping efforts and workshops that rated current and projected impacts on transportation infrastructure. IDT members advocate establishing strong working relationships among shoreline and transportation planners for future efforts. The Washington Coastal Hazards Resilience Network (Section 13.3 below) may provide a venue for this type of engagement to occur.

In addition, coordination with WSDOT's Rail Division could identify future restoration actions along the BNSF rail corridor. A recent [Landslide Mitigation Action Plan](#) prepared by WSDOT (2014) recommended exploration of options for using landslide debris for beach nourishment in the sediment-starved drift cells adjacent the armored rail line.

13.2 HAZARD MITIGATION GRANTS

Engagement with hazard mitigation planners could provide a way to proactively address homeowner concerns about coastal flooding and erosion risks due to rising storm surges, and access new funding streams. Three hazard mitigation assistance programs administered by FEMA in coordination with the Washington Emergency Management Division (EMD) provide funding to reduce the effects of natural hazards and mitigate vulnerability to future disaster damage.

HAZARD MITIGATION GRANT PROGRAM

This program provides competitive (state-level) grants for planning and projects designed to reduce or eliminate the effects and costs of future disaster damage. Grant applications are solicited by EMD after a Presidential Declaration of Major Disaster; Washington's most recent declaration was in April 2017 for severe winter storms, flooding, landslides, and mudslides.

Available grant funding is equal to 20% of total federal disaster assistance dollars provided by FEMA. Grants have a 25% non-federal match requirement, which the state may split with the local grant recipient. Applications are reviewed and ranked by EMD prior to submission to FEMA. Declared counties are given priority.

To be eligible for a project grant, applicants must have a FEMA-approved Hazard Mitigation Plan. Property acquisition and structure demolition, relocation, or elevation are among eligible projects. Planning grants fund efforts to create new FEMA-approved Hazard Mitigation Plans or update existing plans.

PRE-DISASTER MITIGATION PROGRAM

This program provides annual, competitive (national-level) grants for measures designed to reduce injuries, loss of life, and damage/destruction of property. Only states, tribes, and U.S. territories may apply; local governments are considered sub-applicants. Only one grant application will be accepted from each state, tribe, or territory. Applicants must rank all the sub-applications included in their application.

In fiscal years [2016](#) and [2017](#), \$90 million was available under this program. The federal share is generally 75% of eligible activity costs but small, impoverished communities may be eligible for a 90% federal cost share. Maximum allowed federal contributions vary based on activity type; for example, \$4 million for mitigation projects, \$400,000 for new mitigation plans, and \$150,000-\$300,000 for plan updates depending on single or multi-jurisdiction coverage.

FLOOD MITIGATION ASSISTANCE PROGRAM

This program provides annual funding for projects and planning to reduce or eliminate long-term risk of flood damage to structures insured under the NFIP. Individual homeowners, businesses, and non-profits may apply for funding through eligible sub-applicants (like local

governments and state/tribal agencies) who then sponsor applications at the state/tribe/territory level.

In fiscal year [2017](#), \$160 million was available under this program; community level planning/prioritization and natural floodplain restoration solutions were prioritized for \$70 million of the available funding. Federal cost share is 75%, except for properties that meet repetitive loss (90%) or severe repetitive loss (100%) thresholds.

13.3 COASTAL RESILIENCE GRANTS

This national competitive grant program administered by NOAA aims to increase resilience to extreme weather and climate-related hazards and reduce risk to coastal communities and ecosystems. The program's 2 focus areas are strengthening coastal communities and habitat restoration. In 2017, 19 projects nationwide were selected to receive \$13.8 million. Grant recipients provide one-third of total project costs.

Two notable ongoing projects are supported by this program:

- [Washington Coastal Hazards Resilience Network](#) (CHRN) – Ecology and Washington Sea Grant developed this partnership to improve regional coordination among practitioners. Originally funded by a prior NOAA grant and continued with a Resilience Grant, CHRN supports local communities by collecting and distributing technical information, helping local planners incorporate best management practices, and facilitating greater awareness of coastal hazards.
- [Washington Coastal Resilience Project](#) – Led by Washington Sea Grant and Ecology, this project brings together multiple partners to improve risk projections, provide guidance for local land use planners, and strengthen capital investment programs for coastal restoration and infrastructure. Island County and Tacoma are serving as model communities.

13.4 NORTH PACIFIC LANDSCAPE CONSERVATION COOPERATIVE

Landscape Conservation Cooperatives (LCCs) are member-directed partnerships among state and federal agencies, tribes, nongovernmental organizations, and universities. They are a result of a 2009 Department of the Interior [order](#), and are intended to inform resource management actions and provide conservation tools (e.g., shared information management systems) to address landscape-level stressors such as climate change and habitat fragmentation. The LCC network consists of 22 individual LLCs, several of which have relationships with conservation entities in Canada or Mexico.

North Pacific LCC [steering committee members](#) include representatives from 10 U.S and 2 Canadian federal agencies; the states of California, Oregon, Washington, Alaska and province of British Columbia; and indigenous peoples from each of these 5 regions. Its purpose is to develop and disseminate science and Traditional Ecological Knowledge to advance landscape-scale conservation in the face of changing climate.

The effects of changes in sea levels and storms on marine shorelines, the nearshore, and estuaries is a priority topic for the North Pacific LCC. A [Conservation Planning Atlas](#) developed by the North Pacific LCC is a data management and visualization platform that could help support the Planning Strategy. In addition, USFWS has offered funding to support collaborative science activities consistent with the North Pacific LCC Implementation Plan. The most recent announcement, for 2016 funding, indicated that \$50,000 to \$200,000 may be available for 1 to 5 projects.

14. ACQUISITION AND RESTORATION FUNDING

The Shoreline Armoring Implementation Strategy recognizes that enacting these 4 strategies does not reduce the need to continually implement the on-the-ground projects necessary for recovery. This section describes potential sources of federal, state and quasi-governmental funding and technical assistance that could be used to fund direct restoration and property acquisitions.

Table 4 (Section 15) summarizes several state and federally administered funding programs. Washington State's Recreation and Conservation Office (RCO) provides fiscal and contract management support to other state agencies implementing these programs, and manages their own grant programs. Several of these programs distribute a mix of state and federal funding. RCO administers federal funds from a variety of sources as well as the state funds (e.g., Aquatic Lands Enhancement Account¹⁶ and Puget Sound Acquisition and Restoration Fund) used to meet grant match requirements.

Projects are commonly funded through a combination of several different sources, so **these programs are more interrelated than indicated in Table 4 and the descriptions below.**

14.1 PUGET SOUND ACQUISITION AND RESTORATION FUND

The Puget Sound Acquisition and Restoration (PSAR) Fund was created in 2007. It is funded through the state capital budget and provides the state match for several federal grant programs described below.

PSAR also solicits and funds large habitat restoration and acquisition projects every other year. Project sponsors submit proposals to local [Lead Entities](#) who review and select up to 3 projects to submit for further consideration. Projects are then reviewed and ranked by the Salmon Recovery Funding (SFR) Board, Puget Sound Partnership, and Puget Sound Salmon Recovery

¹⁶ The Aquatic Lands Enhancement Account is funded by revenue generated through WDNR management of state-owned aquatic lands. It was created in 1984 and provides funding for acquisition, improvement, or protection of aquatic lands for public purposes.

Council before going to the Washington Office of Financial Management, Governor's office, and legislature as part of a biennial budget request.

14.2 ESTUARY AND SALMON RESTORATION PROGRAM

The Estuary and Salmon Restoration Program (ESRP) was created in 2006 to implement restoration projects using guidance and strategies developed as part of the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP), described in Section 14.8. Federal funding comes from a variety of sources, including NOAA's Community-Based Restoration Program, the National Coastal Wetlands Conservation Grant Program, and the National Estuary Program (via the Marine and Nearshore LO and Habitat SI).

The program provides funding and technical assistance for process-based¹⁷ habitat protection and restoration in Puget Sound. ESRP is administered by WDFW in partnership with RCO. Additional technical support is provided by the National Oceanographic and Atmospheric Administration's (NOAA) Restoration Center Northwest and PSP.

ESRP solicits restoration and protection proposals every other year. All phases of projects—acquisition, feasibility, design, restoration, and monitoring—are eligible. Local/state/federal agencies, tribes, academic institutions, private institutions, and nonprofit organizations are eligible to apply. An average of \$10 million is awarded for Puget Sound projects biennially (RCO 2017a). Proposals are evaluated by a multi-disciplinary technical review team composed of members from multiple agencies and organizations.

Armor removal projects tend to rank lower during this review process relative to large estuary projects. This is because beach projects are significantly more expensive than estuary projects when calculated as cost-per-acre restored. Kinney et al. (2016a) contends that the benefits of beach projects relative to estuary projects are understated because of non-equivalent reporting of area restored for these two types of projects. Focusing on length removed (an output) instead of sediment supply and transport restored (an outcome) downplays the ecosystem impacts of armor removal.

In 2016, ESRP initiated a pilot Small Grants Program that has helped address this issue. Projects funded under this program are eligible to receive funding between \$30,000 and \$150,000—a scale matched to smaller residential projects like those identified by homeowner incentive programs.

¹⁷ Process-based protection and restoration focuses on key natural processes—such as hydrology, sedimentology, geomorphology—that create and sustain nearshore habitat structure and function (Goetz et al. 2004). This emphasis on underlying ecosystem processes impacted by human use and activity is expected to provide greater long-term project sustainability and less maintenance relative to species-specific enhancement efforts.

14.3 PACIFIC COASTAL SALMON RECOVERY FUND

This NOAA program provides funding to reverse the declines of Pacific salmon and steelhead by supporting conservation efforts in 5 western states. PCSRF is a major source of funding for RCO's **Salmon Recovery Grant Program**, which funds projects to restore damaged habitat, fix barriers to fish migration, and preserve pristine habitat.

Salmon Recovery Grant Program applications are accepted annually. Local/state agencies, special purpose districts, tribes, private landowners, nonprofit organizations, and regional fishery enhancement groups are eligible to apply. A 15% match is required. Acquisition, restoration, assessments/inventories, and project designs are eligible. An annual average of \$18 million is awarded to freshwater, estuarine, and marine projects statewide (RCO 2017b).

Applicants submit proposals to their local [Lead Entity](#), who reviews and assembles a ranked list of projects based on goals and actions in the local lead entity recovery plan. The 14 Puget Sound lead entities submit their ranked lists to the Salmon Recovery Funding (SRF) Board, who selects projects for funding. The SRF Boards consists of 5 citizens appointed by the Governor and 5 state agency directors.

14.4 COMMUNITY-BASED RESTORATION PROGRAM

This NOAA program provides funding for coastal and marine habitat restoration to support fish habitat restoration projects. Proposals are evaluated based on their ability to help recovery of species listed under ESA or stocks managed under the Magnuson-Stevens Fishery Conservation and Management Act.

Typical awards range from \$300,000 to \$1.5 million over 1 to 3 years. There is no statutory cost share required, but NOAA encourages applicants to provide a 50% non-federal match. In 2017, NOAA recommended funding for \$4.5 million in cooperative agreements for 10 new projects (2 in the Northwest region) and \$5 million to continue projects begun in 2016. Restoration of delta, tidal, floodplain, and riparian ecosystem function within Puget Sound was one of four programmatic goals listed in the [2017 Federal Funding Opportunity](#) solicitation for this program.

Though not common, removal of shoreline armoring in Puget Sound has also been funded through NOAA's **Damage Assessment, Remediation, and Restoration Program** (DARRP). This program restores natural resources at hazardous waste sites, and after oil spills or other impacts like ship groundings. Injuries to NOAA trust resources are repaired when possible, or replaced through restoration projects that focus on revitalizing and improving coastal and marine habitats. Funding is obtained from parties responsible for the damages, so there are no competitive requests for project proposals nor annual appropriations.

14.5 NATIONAL COASTAL WETLANDS CONSERVATION GRANT PROGRAM

This USFWS-administered program was established to acquire, restore, and enhance wetlands in coastal states through competitive matching grants to state agencies. Ecology's Shorelands and Environmental Assistance Program sponsors Washington's applications. The program is funded by revenue from excise taxes on sport fishing equipment and motorboat fuel (~\$17 million annually in recent years).

Grants are limited to \$1 million per project. Project ranking criteria are outlined in [50 CFR Part 84.31](#). A 25% non-federal cost share is required. Only state agencies are eligible to apply, but Ecology solicits applications in June of each year and frequently partners with tribes, cities, counties, land trusts, and other state/federal agencies. In recent years, Washington has been quite successful securing project funding through this grant program. In 2017, Ecology received \$4.7 million for [6 projects](#).

14.6 QUASI-GOVERNMENTAL ORGANIZATIONS

REGIONAL FISHERIES ENHANCEMENT GROUPS

Washington's Legislature created the Regional Fisheries Enhancement Group (RFE) Program to involve local communities, citizen volunteers, and landowners in the state's salmon recovery efforts. RFEs work within geographic regions (based on watershed boundaries) to lead their communities in successful restoration, education, and monitoring projects.

Each of the Puget Sound region's 7 RFEs are a nonprofit organization led by their own board of directors and supported by their members. They are funded by commercial and recreational fishing license fees administered by WDFW; grants from government and private entities; and individual donations and in-kind contributions from local community members and businesses.

RFEs utilize local salmon recovery plans and priorities to implement a variety of projects, including beach restoration through armor removal.

NATIONAL FISH AND WILDLIFE FOUNDATION

The NFWF was created by Congress in 1984 to conserve fish, wildlife, and plant species through innovative partnerships with federal agencies, corporations, foundations, and nonprofit organizations to generate new resources for conservation.

NFWF is a non-profit organization with a Board of Directors approved by Secretary of Interior. They administer several competitive conservation grant-programs with funding received from multiple federal agencies, corporations, and private foundations. Sponsors of In-lieu fee programs (described in Section 3.4) can elect to contract with NFWF for fiscal management and project contracting.

NFWF activity in Puget Sound includes a Killer Whale Research and Conservation Program and salmon habitat restoration grants. However, no armor removal has been funded through this program.

14.7 NON-GRANT ACQUISITION FUNDING

CONSERVATION FUTURES FUND

[RCW 84.34.230](#) and [RCW 84.34.240](#) authorized counties to levy a property tax for funding property acquisitions (fee simple, easements, and development rights) to preserve lands of public interest for future generations. Proceeds can also be used for maintenance and restoration of acquired properties. Revenue raised through this tax is placed in a county's Conservation Futures Fund. All Puget Sound counties except Clallam and Mason raise revenue through the conservation futures tax (Futurewise 2014d). Counties manage their Conservation Futures Fund in a variety of ways (Futurewise 2014d). For example: [Skagit](#) and Whatcom use conservation futures to purchase farmland easements; Kitsap and Whatcom fund park acquisitions; King, [Snohomish](#), [Thurston](#), and [Jefferson](#) distribute funds as part of grant programs; the [San Juan County Land Bank](#) administers San Juan County's Fund along with proceeds from their Real Estate Excise Tax (REET) for Conservation Areas.¹⁸

COASTAL AND ESTUARINE LAND CONSERVATION PROGRAM

This NOAA cost-share program provides states with funds to purchase or obtain conservation easements on estuarine lands. In recent years, competition for funding has been limited to the Great Lakes region. The maximum federal share is \$1.5 million; a 50% non-federal match is required. Ecology is the lead agency for Washington and prepared a [Conservation Plan](#) to identify priorities in 2007.

14.8 NON-GRANT RESTORATION FUNDING

CORPS OF ENGINEERS CIVIL WORKS PROGRAMS

In addition to the regulatory program described in Section 2.1 and Appendix A.3, the Seattle District USACE has a variety of civil works authorities that could be used to remove shoreline armoring. These are cost-share programs that do not distribute grants.

¹⁸ [RCW 82.46.070](#) authorized counties to impose an excise tax (not to exceed 1%) on real estate sales with proceeds used for acquisition and maintenance of conservation areas. This REET tax must be approved by county voters. REET for Conservation Areas measures have appeared on ballots in several counties but were approved only in San Juan County (Futurewise 2014d).

The Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) was a General Investigation¹⁹ study initiated in 2001 by the Seattle District Corps with WDFW as the local sponsor. A total of 36 projects were evaluated in the [PSNERP Feasibility Report](#), including 4 beach strategy projects (Table 3).

Although the IDT did not develop strategies for implementation of previously-identified large projects, such projects may be the difference between meeting or not meeting the Vital Sign indicator target. **If the full restoration scenarios were implemented, these four PSNERP projects would result in removal of just under a mile of armor.** This would be enough to make up for the net increase observed between 2011 and 2017.

Table 3. Summary of PSNERP beach strategy projects

Name and Project Proponent	Project Elements
Beaconsfield Feeder Bluff - City of Normandy Park	<u>Full restoration scenario:</u> - Remove 830' of armor, minor regrade of upper beach - Property acquisition and house removal <u>Partial restoration scenario:</u> - Remove 660' of armor, minor regrade of upper beach
Twin Rivers - Lower Elwha Tribe	- Remove 1,200' of rock revetment, a 425' sheet pile wall, and fill
Marine Lab/Budd Inlet Beach - WA Dept. of Natural Resources	<u>Full restoration scenario:</u> - Remove 735' of bulkheads, 400' of rock revetment, and fill - Property acquisition - Beach regrade and nourishment, - Excavate tidal channel to connect barrier lagoon - Contaminated sediment and debris removal <u>Partial restoration scenario:</u> - Remove a 485' of bulkheads, 400' of rock revetment, and fill - Beach regrade and nourishment - Contaminated sediment and debris removal
Twanoh State Park - WA State Parks	- Remove 1,253' of rock revetment and 260' of bulkhead - Remove fill, regrade beach profile - Beach nourishment - Restore tide channel and lagoon

Source: PSNERP 10% conceptual design report (ESA-PWA 2012)

¹⁹ General Investigations (GI) are large-scale, complex water resource projects are initiated by a local sponsor and occur in [multiple phases](#) that take years to complete. Congressional authorization is required both to initiate a study and to formally approve any recommended plan. The study scope can include one or more different Corps mission areas (navigation, flood risk management, ecosystem restoration, emergency operations, and recreation) and federal contributions are not limited to a set dollar amount.

No beach restoration projects were recommended for construction as part of the GI plan approved by Congress, but these projects may be pursued under other Corps authorities²⁰ or by others. Seattle District’s [Puget Sound and Adjacent Waters Restoration Program](#) (Section 544) can be used to implement critical restoration projects consistent with fish restoration goals of NMFS and the State of Washington. A non-federal sponsor must pay 35% of total project costs. The authorizing statute directs the Corps to consider existing regional watershed studies and plans when prioritizing projects. This authority was used for Seahurst Park armor removal and beach restoration projects completed in 2014.

In addition, Seattle District’s [Navigation Section](#) conducts regular maintenance dredging of several previously-authorized navigation projects in Puget Sound. Sometimes this produces clean sand that can be disposed as “beneficial use” in beach nourishment projects, rather than in open-water disposal sites approved by the multi-agency [Dredged Material Management Office](#). For example, over 18,000 cubic yards of sand obtained during 2016 Everett Harbor maintenance dredging was placed at [6 beach nourishment sites](#) located in a drift cell severely impacted by sediment impoundment due railroad construction (Snohomish MRC 2017). These types of projects can be arranged directly with Seattle District and a local project sponsor via a Memorandum of Understanding, or through a CAP Section 204 project.

15. SUMMARY OF PROGRAMS WITH POTENTIAL TO SUPPORT IMPLEMENTATION

Table 4 provides a summary of programs that could potentially provide funding or technical assistance to support implementation of the strategies described in this report.

²⁰ USACE can plan, design, and construct small-scale projects under the [Continuing Authorities Program](#) (CAP). Unlike GIs, CAP studies and project approval occur at the Northwest Division Office. Since two acts of Congress are not required, projects can be implemented in a relatively short amount of time. Local governments, state agencies, or tribes must request assistance and are required to cost-share study and construction costs. For most CAP authorities, the federal share cannot exceed \$5 million per project. The typical cost-share is 65% federal and 35% local. Relevant CAP authorities include Section 206 (Aquatic habitat ecosystem restoration), Section 1135 (Project modifications for improvement of the environment), and Section 204 (Beneficial use of dredges material).

Table 4. Overview of potential sources of funding and technical assistance for strategy implementation

State programs	Administering agencies	Federal funds provided through	Types of investments/assistance
Habitat Strategic Initiative (and its predecessor, the Marine and Nearshore Grant Program)	WDFW WDNR	National Estuary Program (EPA)	Planning, acquisition, training, restoration, monitoring, program development and management
Estuary and Salmon Restoration Program	WDFW RCO	National Estuary Program (EPA) Community-Based Restoration Program (NOAA)	Acquisition, restoration, monitoring
Coastal Wetlands Conservation Grant Program	Ecology	National Coastal Wetlands Conservation Grant Program (USFWS)	Acquisition, restoration
Salmon Recovery Grants	RCO SRF Board	Pacific Coastal Salmon Recovery Fund (NOAA)	Acquisition, restoration, monitoring
Puget Sound Acquisition and Restoration Fund	PSP RCO	(provides state match to federal grants)	Acquisition, restoration
Aquatic Lands Enhancement Account	RCO	n/a	Acquisition, restoration
Shoreline Master Program Grants	Ecology	Coastal Zone Management Grants (NOAA)	Planning
Coastal Protection Fund	Ecology	n/a	Enhancement, monitoring, GIS
Hazard Mitigation Assistance	EMD	Hazard Mitigation Grant Program (FEMA) Pre-Disaster Mitigation Program (FEMA) Flood Mitigation Assistance Program (FEMA)	Acquisition, planning, structure demolition/relocation/elevation/flood-proofing, climate resilience
Regulatory Innovation Center	ORIA	n/a	Facilitation, coordination, process improvement
Padilla Bay National Estuarine Research Reserve	Ecology	National Estuarine Research Reserve Program (NOAA)	Training, monitoring
Washington Coastal and Estuarine Land Conservation Program	Ecology	Coastal and Estuarine Land Conservation Program (NOAA)	Acquisition
Conservation Futures Funds	10 Puget Sound counties	n/a	Acquisition
Land and Water Conservation Fund	RCO	Land and Water Conservation Fund State and Local Assistance Program (National Park Service)	Acquisition, recreation
Washington Wildlife and Recreation Program	RCO	n/a	Acquisition, recreation

(Continued on next page)

Table 4. Overview of potential sources of funding and technical assistance for strategy implementation

Other sources of project, planning, and technical assistance funding	Types of investments/assistance
Coastal Resilience Grants (NOAA)	Planning, restoration
Damage Assessment, Remediation, and Restoration Program (NOAA)	Compensation for natural resource damages associated with oil spills or other impacts
Puget Sound Nearshore Ecosystem Restoration Project (WDFW and USACE)	Restoration
Puget Sound and Adjacent Waters Restoration Section 544 (USACE)	Restoration
Continuing Authority Programs Sections 206 and 1135 (USACE)	Restoration
Planning Assistance to States and Tribes (USACE)	Planning
Puget Sound Coastal Program (USFWS)	Technical assistance, resource assessments, outreach and education, project planning and implementation
North Pacific Landscape Conservation Cooperative (USFWS and others)	Climate vulnerability assessment, decision support tools and data, conservation planning and design, spatial data management
Northwest Regional Office, Coastal Habitats in Puget Sound (USGS)	Coastal inundation modeling and mapping
National Fish and Wildlife Foundation	Restoration, research
Regional Fisheries Enhancement Groups	Restoration, education, monitoring
Washington Sea Grant	Training, technical assistance, climate resilience planning

16. ACRONYMS

ACIP	American Institute of Certified Planners
APPS	Aquatic Protection Permitting System
BFE	Base Flood Elevation
BiOp	Biological Opinion
CAP	Continuing Authorities Program
CCMP	Comprehensive Conservation and Management Plan
CD	Conservation District
CFR	Code of Federal Regulations
CHRN	Coastal Hazards Resilience Network
Corps	U.S. Army Corps of Engineers
CUP	Conditional Use Permit
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
DARRP	Damage Assessment, Remediation, and Restoration Program
Ecology	Washington Department of Ecology
ECB	Ecosystem Coordination Board
EMD	Washington Emergency Management Division
ESA	Endangered Species Act
ESRP	Estuary and Salmon Restoration Program

FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FHWA	Federal Highway Administration
GSH	Green Shores for Homes
HAT	Highest Astronomical Tide
HCCC	Hood Canal Coordinating Council
HPA	Hydraulic Project Approval
IDT	Interdisciplinary Team
ILF	In-Lieu Fee Program
IS	Implementation Strategy
LCC	Landscape Conservation Cooperative
LID	Low Impact Development
LO	Lead Organization
MLLW	Mean Lower Low Water
MHHW	Mean Higher High Water
MRC	Marine Resources Committee
MSRC	Municipal Research and Services Center
MSDG	Marine Shoreline Design Guidelines
NEPA	National Environmental Policy Act
NEP	National Estuary Program
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act

NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NTA	Near Term Action
NWIFC	Northwest Indian Fisheries Commission
NWP	Nationwide Permit
NWSF	Northwest Straits Foundation
OCRM	Office of Coastal Resource Management
OHWL	Ordinary High Water Line
OHWM	Ordinary High Water Mark
ORIA	Governor's Office for Regulatory Innovation and Assistance
PBRS	Public Benefit Rating System
PCN	Pre-construction Notice
PSI	Puget Sound Institute
PSNERP	Puget Sound Nearshore Ecosystem Restoration Study
PSP	Puget Sound Partnership
RBZ	Riparian Buffer Zone
RCO	Washington State Recreation and Conservation Office
RCW	Revised Code of Washington
REET	Real Estate Excise Tax
RLF	Revolving Loan Fund
RPM	Reasonable and Prudent Measures
SDP	Substantial Development Permit

SFHA	Special Flood Hazard Area
SHARP	Shoreline Armoring Reduction Program
SI	Strategic Initiative
SMA	Shoreline Management Act
SMP	Shoreline Master Program
SFR Board	Salmon Recovery Funding Board
TACT	Troubleshooting, action planning, course correction, and monitoring
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
U.S.C.	U.S. Code
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WSCC	Washington State Conservation Commission
WSDOT	Washington State Department of Transportation
WSU	Washington State University

17. REFERENCES

- Adkins, B. 2013. Final Report for Grant 10-1744 (Protecting Nearshore and Marine Habitat in Mason County). Deliverable to the Marine and Nearshore Grant Program.
- Barnhart, K., S. Key, and P.E. Dionne. 2015. *Shoreline Permitting Effectiveness through T.A.C.T. Final Report*. Kitsap County, San Juan County, and Washington Department of Fish and Wildlife.
- Beamer, E. and K. Fresh. 2012. Juvenile salmon and forage fish presence and abundance in shoreline habitats of the San Juan Islands, 2008-2009: Map applications for selected fish species. Prepared for San Juan Department of Community Development and Planning, and San Juan County Marine Resources Committee.
http://skagitcoop.org/wp-content/uploads/Beamer_Fresh_2012_Final.pdf
- Cereghino, P., J. Toft, C. Simenstad, E. Iverson, S. Campbell, C. Behrens, J. Burke. 2012. *Strategies for nearshore protection and restoration in Puget Sound*. Puget Sound Nearshore Report No. 2012-01. Published by Washington Department of Fish and Wildlife, Olympia, Washington, and the U.S. Army Corps of Engineers, Seattle, Washington.
http://www.pugetsoundnearshore.org/technical_papers/psnerp_strategies_maps.pdf
- Chesapeake Bay Trust. 2017. Chesapeake Bay Trust 2015-2016 Annual Report.
https://cbtrust.org/wp-content/uploads/AR_web_Jan17.pdf
- Council of Development Finance Agencies. n.d. CDFA Spotlight: Revolving Loan Funds (RLFs). Accessed September 2017.
<https://www.cdfa.net/cdfa/cdfaweb.nsf/ordredirect.html?open&id=rffactsheet.html>
- Dethier, M.N., W.W. Raymond, A.N. McBride, J.D. Toft, J.R. Cordell, A.S. Ogston, S.M. Heerhartz, and H.D. Barry. 2016a. Multiscale impacts of armoring on Salish Sea shorelines: Evidence for cumulative and threshold effects. *Estuarine, Coastal, and Shelf Science* 175: 106-117.
- Dethier, M.N., J.D. Toft, and H. Shipman. 2016b. Shoreline armoring in an inland sea: science-based recommendations for policy implementation. *Conservation Letters*. DOI: 10.1111/conl.12323
- Dionne, P.E., H. Faulkner, W. Dezan, K. Barnhart, S. Key, and T. Quinn. 2015. *Tracking and Monitoring of Marine Shoreline Stabilization Permits Final Report*. Habitat Program, Washington Department of Fish and Wildlife, Olympia, WA.
- Dorfmeier, E. and L. Fore. 2016. *Using Permits to Protect Nearshore Property and Fish Habitat: San Juan, King, and Kitsap Counties*. Background Summary. Puget Sound Partnership, Tacoma, WA.

Environmental Science Associates-Phillip Williams Associates, Anchor QEA, Coastal Geologic Services, KPFF Consulting Engineers, and Pacific Survey and Engineering. 2012. Puget Sound Nearshore Ecosystem Restoration Project: Strategic Restoration Conceptual Engineering – Design Report.

http://www.pugetsoundnearshore.org/technical_papers/cdr/Design_Rpt_final.pdf

ESA Adolfson. 2010. City of Tacoma Shoreline Habitat Fee-in-Lieu Mitigation Proposal (Draft). Prepared for City of Tacoma Community and Economic Development. Seattle, WA.

http://cms.cityoftacoma.org/planning/shoreline/draft_smp_package/draft_feeinlieu_091510.pdf

Evergreen Funding Consultants, ECONorthwest, and Triangle Associates, Inc. 2014. Funding Strategy for the Strategic Initiatives from the 2012-2013 Puget Sound Action Agenda, Volume 1: Summary of Findings and Recommendations. Prepared for Puget Sound Partnership and Ecosystem Coordination Board Finance Subcommittee.

http://www.psp.wa.gov/downloads/EC2015/Final_Funding_Strategy_Report_Volume_1_Findings_and_Recommendations_2014_09_10.pdf

Faghin, N. and M. Mateo. 2014. *Tax Incentives for the Prevention and Removal of Hard Armoring Along Shoreline Properties*. Prepared for the Puget Sound Partnership, Ecosystem Coordination Board Regulatory Subcommittee.

<https://wsg.washington.edu/wordpress/wp-content/uploads/Tax-Incentives-for-Preventing-Removing-Shoreline-Hard-Armoring.pdf>

Faghin, N. and S. von Reis Crooks. 2015. Shoreline Technical Assistance for Homeowners in the Puget Sound Region. Washington Sea Grant Technical Report WSG-TR 15-01. Prepared for the Puget Sound Partnership, Ecosystem Coordination Board Regulatory Subcommittee.

<https://wsg.washington.edu/wordpress/wp-content/uploads/Shoreline-Technical-Assistance-for-Homeowners.pdf>

Faghin, N. 2016. *Shoreline Stabilization and the Permit Process: Focus on Single Family Residential Properties*. Summary from March 31, 2016 Shoreline and Coastal Planners Group meeting. Washington Sea Grant and Washington Department of Ecology.

https://www.eopugetsound.org/sites/default/files/features/resources/SCPG_20160331_MeetingSummary.pdf

Friends of the San Juans. 2014. *Healthy Beaches for People and Fish: Protecting Shorelines from the Impacts of Armoring Today and Rising Seas Tomorrow*. Final Report to WDFW and the U.S. EPA. Friday Harbor, Washington. http://sanjuans.org/wp-content/uploads/2016/11/FSJ_2014_Health_Beaches_Project_Final_Report.pdf

Futurewise. 2014a. *Practical Guide: Shoreline Permitting and Mitigation to Achieve No Net Loss*. Prepared by D. Patterson, H. Trim, and T. Trohimovich.

Futurewise. 2014b. *Practical Guide: Interagency Coordination in Implementing Shoreline Regulations*. Prepared by D. Patterson, H. Trim, and T. Trohimovich.

Futurewise. 2014c. *Practical Guide: Cost-Effective Compliance with Shoreline Regulations*. Prepared by D. Patterson, H. Trim, and T. Trohimovich.

Futurewise. 2014d. *Practical Guide: Incentives to Help Meet Priority Shoreline Restoration and Protection Objectives*. Prepared by D. Patterson, H. Trim, and T. Trohimovich.

Gianou, K. 2014. Soft Shore Stabilization: Shoreline Master Program Planning and Implementation Guidance. Department of Ecology Publication 14-06-009.
<https://fortress.wa.gov/ecy/publications/documents/1406009.pdf>

Goetz, F., C. Tanner, C.S. Simenstad, K. Fresh, T. Mumford, and M. Logsdon. 2004. Guiding Restoration Principles. Puget Sound Nearshore Partnership Report No. 2004-03. Published by Washington Sea Grant Program, University of Washington, Seattle, Washington.
http://www.pugetsoundnearshore.org/technical_papers/principles.pdf

Habitat Strategic Initiative. 2017. Starter Package. Shoreline Armoring Implementation Strategy. Prepared by J. Griffiths, T. Francis, A. Kinney, and L. Fore. Washington Department of Fish and Wildlife and Washington Department of Natural Resources.
<https://pspwa.box.com/s/qeebewrey9nkn1ji4u6tydcgvhua51g9>

Habitat Strategic Initiative. 2018. Narrative. Shoreline Armoring Implementation Strategy. Washington Department of Fish and Wildlife and Washington Department of Natural Resources. <https://pspwa.box.com/v/PublicIS-ShoreArmoring>

Harrison, K. 1995. Is cooperation the answer? Canadian environmental enforcement in comparative context. *Journal of Policy Analysis and Management*. 14: 221-244.

ICF International. 2014. *Review and Analysis of the Updated Shoreline Management Plans for Jefferson, Whatcom, Snohomish, and King Counties*. Report for the Northwest Indian Fisheries Commission.

Island County. 2016. Final Report for Landowner Incentives to Reduce Puget Sound Shoreline Armoring in Island County. Report to the Marine and Nearshore Grant Program by A. Toledo, Island County Department of Natural Resources.

Johannessen, T. 2012. Summary of Needs Assessment for Targeted Outreach to Shoreline Landowners in the Port Susan Marine Stewardship Area. Prepared for the Northwest Straits Foundation by EE Outcomes Consulting.

Johannessen, T. 2013a. *Targeted Outreach to Reduce Impacts from Shore Armor in the Port Susan Marine Stewardship Area: County Planner Needs Assessment and Workshop Summary Report*. Prepared for the Northwest Straits Foundation by EE Outcomes Consulting.

Johannessen, T. 2013b. *Targeted Outreach to Reduce Impacts from Shore Armor in the Port Susan Marine Stewardship Area: Program Assessment Summary Report*. Prepared for the Northwest Straits Foundation by EE Outcomes Consulting.

Johannessen, J., A. MacLennan, A. Blue, J. Waggoner, S. Williams, W. Gerstel, R. Barnard, R. Carman, and H. Shipman. 2014. *Marine Shoreline Design Guidelines*. Washington Department of Fish and Wildlife, Olympia, Washington.

<http://wdfw.wa.gov/publications/01583/wdfw01583.pdf>

Keller, H. 2012. *Exploration of Shoreline Property Owner Knowledge and Awareness of Shoreline Management and Habitat Issues*. Report to WSU Mason County Extension.

King County. 2014. *The WRIA 9 Marine Shoreline Monitoring and Compliance Pilot Project*. Prepared by Kollin Higgins, Water and Land Resources Division.

Kinney, A., T. Francis, and J. Rice. 2015. *Analysis of Effective Regulation and Stewardship Findings: A Review of Puget Sound Marine and Nearshore Grant Program Results, Part 1*. Puget Sound Institute. Tacoma, WA.

https://www.eopugetsound.org/sites/default/files/features/resources/AnalysisOfEffectiveRegulationAndStewardshipFindings_FINAL_2015-12-14.pdf

Kinney, A., T. Francis, and J. Rice. 2016a. *Analysis of Strategic Capital Investments for Habitat Restoration and Protection: A Review of Puget Sound Marine and Nearshore Grant Program Results, Part 3*. Puget Sound Institute. Tacoma, WA.

https://www.eopugetsound.org/sites/default/files/features/resources/AnalysisReportPart3_Final.pdf

Kinney, A., T. Francis, and J. Rice. 2016b. *Puget Sound Marine and Nearshore Grant Program: Synthesis of 2011-2014 Results and Key Recommendations for Future Recovery Efforts*. Puget Sound Institute. Tacoma, WA.

<https://www.eopugetsound.org/sites/default/files/features/resources/FINALAnalysisReport.pdf>

Lear, C. 2013. Summary report for use with Clallam County's Shoreline Master Program: A report to Inform SMP planning. Clallam County Department of Community Development. Report to the Puget Sound Marine and Nearshore Grant Program.

Lund, P.J. and L.K. Hoberecht. 2016. Shellfish Interagency Permitting Team, Phase I Report. Washington Department of Ecology Southwest Regional Office and NOAA Fisheries West Coast Regional Office. <http://www.ecy.wa.gov/programs/sea/aquaculture/pdf/SIPPhaseOneRpt.pdf>

Mason Conservation District. 2016. Shore Friendly Mason Final Report. Report to the Puget Sound Marine and Nearshore Grant Program.

Municipal Research and Services Center. 2017. Code Enforcement. Web page accessed July 2017. <http://mrsc.org/Home/Explore-Topics/Legal/Regulation/Nuisances-Regulation-and-Abatement/Code-Enforcement.aspx>

National Ocean Service. 2000. Tidal Datums and Their Applications. Center for Operational Oceanographic Products and Services, Silver Spring, MD. NOAA Special Publication NOS CO-OPS 1. https://tidesandcurrents.noaa.gov/publications/tidal_datums_and_their_applications.pdf

Northwest Indian Fisheries Commission. 2015. *Analysis of Newly Approved County SMPs and Recommendations for Change*. Memorandum to the Regulatory Subcommittee of the Salmon Recovery Council, October 26, 2015.

Northwest Straits Foundation. 2016. Landowner Incentives to Reduce Puget Sound Armoring: Final Report for Project #14-01929. Prepared for the Marine and Nearshore Grant Program.

Ott, S.S. and T. Bowling 2013. Incentivizing the Use of Living Shorelines in Virginia through a Revolving Loan Fund. National Sea Grant Law Center Report 13-04-04. <http://nsglc.olemiss.edu/Advisory/Living-Shoreline-RLF-Report.pdf>

Pace, N. 2017. Permitting a Living Shoreline: A Look at the Legal Framework Governing Living Shoreline Projects at the Federal, State, and Local Level. In Bilkovic, D., M. Mitchell, M. La Peyre, and J. Toft (eds.). *Living Shorelines*. Boca Raton: CRC Press.

Puget Sound Partnership. 2014. Meeting summary for the May 29-30, 2014 joint meeting of the Ecosystem Coordination Board and the Leadership Council. <https://pspwa.app.box.com/s/gabtrcbzo9i5yybkeyi6lx6cez0bh10o/file/55796065662>

Puget Sound Partnership. 2015a. *Puget Sound Salmon Recovery Council Management Brief on Results of NWIFC Report on Shoreline Armoring, Appendix A: Comments on Regulatory Subcommittee Memo and Recommendations*, November 15, 2015. <https://pspwa.app.box.com/s/gabtrcbzo9i5yybkeyi6lx6cez0bh10o/file/43925365389>

Puget Sound Partnership. 2015b. Considerations for Social Strategies in Planning, Strategic Initiatives, Implementation Strategies, and Near Term Actions. Tacoma, WA. <https://pspwa.box.com/s/gt8bba2c9qr9rhkbleufzc26nd920xy3>

Puget Sound Partnership. 2017a. 2017 State of the Sound. Olympia, WA. <http://www.psp.wa.gov/sos>

Puget Sound Partnership. 2017b. Guidelines for Developing an Implementation Strategy v.2. Tacoma, WA. <https://pspwa.app.box.com/v/IS-Guidance/file/174702019315>

Puget Sound Recovery Implementation Technical Team. 2015. *Puget Sound Chinook salmon recovery: A framework for the development of monitoring and adaptive management plans*. U.S. Department of Commerce, NOAA Tech. Memo NMFS-NWFSC-130.

Puget Sound Tribal Management Conference. 2017. Recommended Priority Actions for the Chinook Implementation Strategy. May 19, 2017 memo to the Puget Sound Salmon Recovery Council. <https://pspwa.app.box.com/s/cm6kajint72xiyo3k0ypytldhxpig44l/file/178912693847>

Rechtschaffen, C. 1998. Deterrence vs. Cooperation and the Evolving Theory of Environmental Enforcement. *Southern California Law Review*. 71: 1181.
<http://digitalcommons.law.ggu.edu/cgi/viewcontent.cgi?article=1037&context=pubs>

San Juan County. 2016. Shoreline Incentives Phase I Final Report. Report to the Puget Sound Marine and Nearshore Grant Program prepared by S. Key, Shoreline Stewardship Coordinator.

Shaffer, A., N. Harris, and D. Parks. 2014. *Protecting the Strait of Juan de Fuca Nearshore through Shoreline Master Program Improvements, Bluff Development Buffers and Building Setbacks, Ecosystem Services Valuation, and Community Stewardship: Field Metrics Final Report*. Coastal Watershed Institute and Washington Department of Natural Resources.

Shimshack, J.P. 2014. The economics of environmental monitoring and enforcement. *Annual Review of Resource Economics*. 6: 339-360. DOI: 10.1146/annurev-resource-091912-151821

Shore Friendly Kitsap Planning Team. 2017. Shore Friendly Kitsap: A Project to Incentivize Voluntary Removal of Waterfront Bulkheads, Phase I Final Report. Report to the Marine and Nearshore Grant Program prepared by J. Adams, K. Barnhart, R. Johnson, C. Kereki, K. Mesebeluu-Yobech, K. Peters, and H. Trim.

Snohomish Marine Resources Committee. n.d. Nearshore restoration project (Howarth Park Beach). Web Page. Accessed September 2017.
<http://www.snocomrc.org/projects/nearshore-restoration-project/>

Talebi, B. and J. Tyson. 2014. *Puget Sound Marine and Nearshore Grant Program Compliance Assessment Project*. Washington Department of Ecology and Washington Department of Fish and Wildlife.

U.S. Environmental Protection Agency. 1993. National Estuary Program Guidance: Base Program Analysis. Office of Water. EPA-842-B-93-01.

U.S. Environmental Protection Agency. 2005. Community-Based Watershed Management: Lessons from the National Estuary Program. EPA-842-B-05-003. Office of Wetlands, Oceans, and Watersheds. https://www.epa.gov/sites/production/files/2015-09/documents/2007_04_09_estuaries_nepprimeruments_srnepprimer.pdf

U.S. Environmental Protection Agency. 2008. Unlocking Brownfields Redevelopment: Establishing a Local Revolving Fund Program. EPA-560-F-08-280.
https://www.epa.gov/sites/production/files/2015-09/documents/bss_rlf_080708_0.pdf

von Reis Crooks, S. 2015. Landowner experiences with soft shore projects in Puget Sound. Master's thesis.
https://digital.lib.washington.edu/researchworks/bitstream/handle/1773/35214/vonReisCrooks_washington_02500_15411.pdf?sequence=1

Washington Department of Commerce. 2017. Critical Areas Assistance Handbook, Chapter 7: Monitoring and Adaptive Management (DRAFT). Growth Management Services, Olympia, WA.
<https://www.ezview.wa.gov/DesktopModules/Documents2/View.aspx?tabID=36886&alias=1949&mid=68532&ItemID=4820>

Washington Department of Fish and Wildlife. 2016a. Marine Bulkhead Replacement Standard Operating Procedure (10/13/16). Habitat Program. Olympia, WA.

Washington Resource Conservation Office. n.d.(a). Estuary and Salmon Restoration Program (ESPR). Web page. Accessed September 2017. <http://www.rco.wa.gov/grants/esrp.shtml>

Washington Resource Conservation Office. n.d.(b). Salmon Recovery Grants. Web page. Accessed September 2017.
<http://www.rco.wa.gov/grants/salmon.shtml>

Washington State Department of Transportation. 2011. Climate Impacts Vulnerability Assessment. Report prepared for the Federal Highway Administration.
<http://www.wsdot.wa.gov/NR/rdonlyres/B290651B-24FD-40EC-BEC3-EE5097ED0618/0/WSDOTClimateImpactsVulnerabilityAssessmentforFHWAFinal.pdf>

Washington State Department of Transportation. 2014. Landslide Mitigation Action Plan. Rail Division, Olympia, WA.
<http://www.wsdot.wa.gov/sites/default/files/2017/03/08/LandslideMitigationActionPlan.pdf>

Windrope, A.H., T. Quinn, K.L. Fresh, and J.K. Gaydos. 2016. Marine Shoreline Management – A 35-Year Evaluation of Outcomes in San Juan County, Washington, US. 2016. *Coastal Management*. 44(6): 1-24. DOI: 10.1080/08920753.2017.1237242.
https://www.researchgate.net/publication/309714745_Marine_Shoreline_Management-A_35-Year_Evaluation_of_Outcomes_in_San_Juan_County_Washington_US

Zinn, M.D., 2002. Policing Environmental Regulatory Enforcement: Cooperation, Capture, and Citizen Suits. *Stanford Environmental Law Journal*. 21 (1): 81–174.

APPENDIX A: PROGRAM FACT SHEETS

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REGULATORY PROGRAM FACT SHEET

A.1 Shoreline Management Act and Shoreline Master Programs

AUTHORITY

Statute: [Chapter 90.58 RCW](#)

Implementing regulations: [Chapter 173-26 WAC](#) and [Chapter 173-27 WAC](#)

The Shoreline Management Act (SMA) is a core element of Washington's federally-approved Coastal Zone Management Program (CZMP), pursuant to the U.S. Coastal Zone Management Act ([16 USC § 1451-1465](#)).

IMPLEMENTING ORGANIZATIONS

Washington Department of Ecology (Ecology) and local government jurisdictions with approved Shoreline Master Programs (SMP).

The Act applies to modifications along lakes, rivers, and large streams in all 39 Washington counties and 200+ cities. This evaluation focuses on bank protection adjacent to Puget Sound marine shorelines: 47 local jurisdictions (12 counties and 35 cities).

REQUIREMENTS AND APPROVALS

The SMA was established to manage development along state and private shorelines. It requires cities and counties to develop, adopt, and implement local Shoreline Master Programs (SMPs). The SMPs consist of land use designations (e.g., urban, natural, aquatic), development standards, and regulations designed to manage shoreline use while protecting natural resources and allowing for responsible development and public access. The local jurisdiction regulates development through four types of approvals:

- **Substantial development permit (SDP)** – required for activities with a total cost exceeding \$6,416, unless specifically exempt
- **Variance** – used to allow an activity to deviate from a SMP's dimensional standards (e.g., setback, height, or lot coverage requirements)
- **Conditional use permit (CUP)** – for activities that are listed as a conditional use in a land use designation or are not addressed in the SMP
- **Exemption** – several activities are specifically exempted from substantial development permitting requirements by [RCW 90.58.030\(3\)\(e\)](#), including bulkheads to protect single family residences and normal maintenance/repair of existing structures.

Ecology ensures local programs consider statewide public interests by providing guidelines to local jurisdictions outlining the essential elements required in their individual SMPs. Ecology

formally approves local SMPs, and provides guidance materials, financial support, technical assistance, and regular training in support of local updates. Ecology also reviews variance and conditional use permits issued by local governments. Permit decisions and penalties can be appealed pursuant to [Chapter 461-08 WAC](#) and [Chapter 173-27 WAC](#).

Critical area regulations adopted under the Growth Management Act apply within shoreline areas until Ecology approves a comprehensive update to the SMP, or a SMP amendment specifically related to critical areas.²¹ Shoreline stabilization provisions in a local SMP should be consistent with critical area and flood hazard reduction provisions.²² Shoreline permits must be accompanied by demonstration of compliance with the State Environmental Policy Act (SEPA).²³ Permits associated with local building and grading codes may also be required.

ENFORCEMENT

Ecology typically defers to the local government as lead on enforcement actions, but is authorized to enforce shoreline programs if a local government is unable or unwilling to do so (Ecology 1998). Ecology can assist the local jurisdiction with investigation, technical support, interagency coordination, and legal support upon request

Per [WAC 173-27-260](#), the choice of enforcement action and the severity of any penalty should be based on the nature of the violation, the damage or risk to public resources, and/or the existence or degree of bad faith of the persons subject to the enforcement action. Ecology (1998) explains that violations can be procedural (failure to obtain a permit, abuse of exemptions) or substantive (the use or activity may not be permit-able, permit conditions were violated, as-built condition does not conform with approved construction plans).

Several formal enforcement tools are available under the SMA:

- Cease and desist orders – Stop work orders can be issued under [WAC 173-27-270](#).
- Civil penalties – Fines of up to \$1000 for each violation, where each day of continued development without a permit considered a separate violation ([RCW 90.58.210](#)).²⁴ Can be issued in combination with a stop work order.
- Criminal penalties – Persons found to have willfully engaged in activities in violation of master program rules and regulation are guilty of a gross misdemeanor punishable by a fine of not more than \$1000 or imprisonment for not more than 90 days ([RCW 90.58.220](#)).

²¹ In accordance with [Engrossed House Bill 1653](#), which was signed into law in 2010.

²² [WAC 173-26-221\(2\)](#)

²³ [RCW 43.21C](#) and [WAC 197-11](#)

²⁴ **Civil penalty** is defined as a monetary penalty administratively issued by a regulatory agency for noncompliance with state or federal law or rules ([RCW 43.05.010](#)).

Criminal referrals to courts are infrequent; the burden of proof for “willful” action is substantial (Ecology 1998).

- Liability for damages – Violators are liable for damage resulting from a violation, including the cost of restoring the affected area to its condition prior to violation ([RCW 90.58.230](#)).
- Permit revocation – [RCW 90.58.140\(8\)](#) allows an issuing authority to rescind a shoreline permit upon the finding that a permittee has not complied with conditions of that permit.

FUNDING

The National Oceanic and Atmospheric Administration (NOAA) Office of Coastal Resource Management (OCRM) provides Ecology with funds to administer its approved CZMP. In fiscal year 2014, Washington’s CZMP had a budget of \$4.5 million (Coastal States Organization 2015). Federal funds comprised \$2.5 million of this total, with the remaining \$2 million from state matching funds.

Less than 45% of the 2014 budget was used for permit review and support for local shoreline program updates. The remainder supported a variety of programs in Puget Sound and the outer coast, including water quality protection; wetland and coastal area conservation and restoration; the Northwest Straits Commission; marine spatial planning; and coastal hazard management.

The primary source of funding for ongoing operation of local programs are fees collected from SMP permit applicants.

STRENGTHS

Major updates SMA’s implementing regulations occurred in 2003. The revised statute included a requirement and schedule for local jurisdictions to comprehensively update their SMPs, most of which were originally written between 1974 and 1978.

As of October 2017, 41 of the 47 jurisdictions with Puget Sound marine shorelines have updated SMPs approved by Ecology (see Appendix A). The average age of these updates is 4 years. Many of the updated SMPs classify shoreline stabilization as a conditional use in all or some area designations (see Table A.1). This change triggers extra review and offers opportunity for Ecology to approve, deny, or condition the local CUP.

The 2003 implementing regulations include two standards for shoreline modifications that should support Vital Sign goals: “demonstration of need” and “no net loss.”

DEMONSTRATION OF NEED

- [WAC 173-26-231\(2\)\(a\)](#) directs SMPs to allow structural stabilization measures only where there is a demonstrated need to protect a primary²⁵ structure or legally existing shoreline use from damage due to erosion.
- Ecology (2016) explains that this standard emphasizes danger of loss or substantial damage to a primary structure, generally within 3 years. The occurrence of erosion or sloughing does not demonstrate need. Landscaping and appurtenant structures, such as sheds, gazebos, patios, and stairways, are not primary structures and do not warrant shoreline stabilization.
- Though specific requirements vary for different types of development (Table 4), geotechnical reports must now be submitted with many applications.
- As described in Section 4.2.6, implementation of this standard by local jurisdictions has been problematic.

NO NET LOSS

[WAC 173-26-186\(8\)](#) requires SMPs to ensure that permitted development does not result in a net loss of ecological functions over time.

- This standard was designed to halt deterioration of shoreline ecological functions resulting from new development. The expectation is that both protection and restoration actions are needed to achieve no net loss (Ecology 2011).
- The baseline for no net loss occurs when an updated SMP is implemented. This condition is documented in the shoreline inventory and characterization developed during the update process.²⁶
- Ecology (2011) describes how local governments should implement the no net loss standard:
 - At the individual permit level, mitigation sequencing²⁷ should be used to avoid, minimize, and compensate for new adverse impacts to the shoreline environment.

²⁵ Local implementation may include secondary structures. For example, driveways, roads, guest houses, utilities, septic components, and wells are considered in San Juan County (K. Loring, Friends of the San Juans, pers. comm.).

²⁶ [WAC 173-26-201\(3\)\(c\)](#)

²⁷ **Mitigation sequencing** is a way for project proponents and regulators to reduce adverse effects. The general approach is to evaluate potential changes or additions to the project scope sequentially: (1) *avoid* impacts by considering practicable alternatives with fewer adverse impacts; (2) *minimize* impacts by incorporating measures to reduce negative effects; and (3) *compensate* for any remaining unavoidable adverse impacts. For SMA, a more detailed 6-step sequence is codified in [WAC 173-26-201\(2\)\(e\)](#).

Impact minimization measures are called different things in different types of permits: “conditions” in SMP and 404/401 approvals; “provisions” in HPAs; and “conservation measures” or “reasonable and prudent measures” during endangered species consultations.

Table A.1.1 Data on local jurisdictions with Puget Sound Marine Shorelines

New armor 2005-2015²⁸	Jurisdiction	SMP update status²⁹	Year updated	Conditional use permit (CUP) required for stabilization³⁰	Active incentive programs³¹
8934 feet	Mason County	Draft	--	In Natural designation only	Shore Friendly, CD, GSH, Shore Stewards
	Shelton	Approved	2015	No	
7320 feet	Pierce County	Ecology review	--	In Aquatic designation only	none
	DuPont	Approved	2013	Yes	
	Gig Harbor	Approved	2013	Yes	
	Lakewood	Approved	2014	Yes	
	Steilcoom	Approved	2013	In some designations	
	Tacoma	Approved	2013	For non-water-dependent uses	
	University Place	Approved	2015	Yes	
7260 feet	Kitsap County	Approved	2014	Yes	Shore Friendly Shore Stewards
	Bremerton	Approved	2013	No	
	Bainbridge Island	Approved	2014	No	
	Port Orchard	Approved	2013	No	
	Poulsbo	Approved	2013	No	
7252 feet	Island County	Approved	2016	In some designations	Shore Friendly SHARP Shore Stewards
	Coupeville	Approved	2009	No	
	Langley	Approved	2013	Yes	
	Oak Harbor	Approved	2014	In some designations	
5845 feet	Skagit County	Draft	--	TBD	SHARP Shore Stewards
	Anacortes	Approved	2010	In some designations	
	La Conner	Approved	2014	No	

²⁸ Source: Hydraulic Project Approvals issued by WDFW

²⁹ Update process: Draft developed → Awaiting local adoption → Locally adopted → Ecology review → Approved and implemented

³⁰ Source: T. Gates, Department of Ecology and <http://www.ecy.wa.gov/programs/sea/shorelines/smp/pdf/smpApprovalTbl.pdf>

³¹ Conservation District (CD) and WSU Extension (Shore Stewards) programs are available in all 12 Puget Sound counties, but this table lists locations where programs targeting marine shorelines are active. GSH = Green Shores for Homes

Table A.1.1 Data on local jurisdictions with Puget Sound Marine Shorelines (cont'd)

New armor 2005-2015	Jurisdiction	SMP update status	Year updated	Conditional use permit (CUP) required for stabilization	Active incentive programs
5676 feet	San Juan County	Approved	2017	No	Shore Friendly, CD, GSH, SHARP, Shore Stewards
	Friday Harbor	Approved	2015	No	
2326 feet	Thurston County	No draft	--	TBD	none
	Lacey	Approved	2011	Yes	
	Olympia	Approved	2015	Yes	
2232 feet	Jefferson County	Approved	2014	Yes	SHARP Shore Stewards
	Port Townsend	Approved	2007	Yes	
1933 feet	Clallam County	Draft	--	In most designations	SHARP
	Port Angeles	Approved	2014	Yes	
	Sequim	Approved	2013	No	
761 feet	King County	Approved	2013	In some designations	CD, GSH
	Burien	Approved	2013	No	
	Des Moines	Approved	2010	In some designations	
	Federal Way	Approved	2011	In some designations	
	Normandy Park	Approved	2016	In some designations	
	Seattle	Approved	2015	In some designations	
	Shoreline	Approved	2013	Yes	
752 feet	Whatcom County	Approved	2008	Yes	SHARP
	Bellingham	Approved	2013	No	
	Blaine	Ecology Review	--	TBD	
442 feet	Snohomish County	Approved	2012	Yes	SHARP
	Edmonds	Approved	2017	No	
	Everett	Approved	2005	In Aquatic Conservancy only	
	Mukilteo	Approved	2012	Yes	
	Marysville	Approved	2006	In Urban Conservancy only	
	Woodway	Approved	2013	Yes	

Table A.1.2 Demonstration of need requirements

Modification Type	Requirements (<i>emphasis added</i>)	Citation
New/enlarged structure to protect existing primary structure	<ul style="list-style-type: none"> - Conclusive evidence, <i>documented by a geotechnical analysis</i>, that the structure is in <i>danger from shoreline erosion</i> caused by tidal action, currents, or waves. - Geotechnical analysis should evaluate on-site drainage issues and address drainage problems away from the shoreline edge before considering structural shoreline stabilization. - Structure will not result in a net loss of shoreline ecological function. 	WAC 173-26-231 (3)(a)(iii)(B)(I)
Support for new development (not water-dependent, includes single family residences)	<ul style="list-style-type: none"> - Need to protect primary structures from damage due to erosion is demonstrated through a <i>geotechnical report</i>. - Erosion is <i>not caused by upland conditions</i>, such as the loss of vegetation and drainage. - <i>Nonstructural measures</i>, such as placing the development further from the shoreline, planting vegetation, or installing on-site drainage improvements, are not feasible or not sufficient. - Structure will not result in a net loss of shoreline ecological function. 	WAC 173-26-231 (3)(a)(iii)(B)(II)
Support for new water-dependent development	<ul style="list-style-type: none"> - The need to protect primary structures from damage due to erosion is demonstrated through a <i>geotechnical report</i>. - Erosion is not being caused by upland conditions, such as loss of vegetation and drainage. - Nonstructural measures, planting vegetation, or installing on-site drainage improvements, are not feasible. - Structure will not result in a net loss of shoreline ecological function. 	WAC 173-26-231 (3)(a)(iii)(B)(III)
To protect projects for the restoration of ecological functions or hazardous substance remediation	<ul style="list-style-type: none"> - Nonstructural measures, planting vegetation, or installing on-site drainage improvements, are not feasible. - Structure will not result in a net loss of shoreline ecological function. 	WAC 173-26-231 (3)(a)(iii)(B)(IV)
Replacement of existing stabilization structure	<ul style="list-style-type: none"> - Demonstrated need to protect principal uses or structures from erosion caused by currents, tidal action, or waves. - Replacement means construction of a new structure to perform a shoreline stabilization function of an existing structure which can no longer adequately serve its purpose. <i>Additions to or increases in size of existing shoreline stabilization measures shall be considered new structures.</i> - Replacement structure should be designed, located, sized, and constructed to assure no net loss of ecological functions. - Replacement structure shall not encroach waterward of OHWM or existing structure unless the residence was occupied prior to January 1992, and there are overriding safety or environmental concerns. In such cases, the replacement structure shall abut the existing structure. - Where a new loss of ecological functions associated with critical saltwater habitats would occur by leaving the existing structure, remove it as part of the replacement measure. - <i>Soft shoreline stabilization measures that provide restoration of shoreline functions may be permitted waterward of OHWM.</i> 	WAC 173-26-231 (3)(a)(iii)(C)

- At the program level, tasks completed during the SMP update process help demonstrate compliance. For example: establishing appropriate shoreline environment designations and requiring buffers and setbacks. The restoration plan identifies priorities, opportunities, and a timeline for shoreline restoration. The cumulative impacts analysis assesses how “reasonably foreseeable future development” is expected to impact ecological functions.
- SMPs must also ensure that exempt development in the aggregate will not cause a net loss of ecological functions.³²
- As described in Section 4.2.6, implementation of this standard by local jurisdictions has been problematic.
- One IDT member contends that the no net loss standard is a weakness of SMA’s implementing regulations rather than a strength, because updated SMPs can rely on mitigating impacts rather than avoiding or prohibiting them. Following the logic of Walker et al. (2009), no net loss could be a political diversion that weakens rules protective of habitat by enabling regulators to circumvent them. For example, San Juan County’s old SMP prohibited armoring feeder bluffs where it will “seriously disrupt the feeder action or the driftway” but the newly-approved update allows armoring feeder bluffs where there is no feasible alternative because impacts would be mitigated off-site (K. Loring, Friends of the San Juans, pers. comm.).

WEAKNESSES

As noted in Section 2., there are 12 counties and 35 cities in the Puget Sound region with shoreline master programs. In recent years, several reports have provided insights into how local permit programs handle marine shoreline stabilization projects. Although the themes that emerged from this body of work are based on materials and input from multiple jurisdictions, the extent to which the conclusions summarized below apply to all SMPs will vary.

There is a wide range of factors influencing implementation of these programs, including jurisdiction size, extent of political interference, and available resources (e.g., financial; data availability and data management systems; number of staff and their experience level). Differences in the written plans also play a large role—some local SMPs have not been updated yet and in those that have shoreline stabilization may be permitted, a conditional use, or prohibited in all or some environmental designations.

LOCAL PROGRAM IMPLEMENTATION

- Barnhart et al. (2015) and Dionne et al. (2015) evaluated 5 years of local and state permits for marine shore protection projects in San Juan and unincorporated Kitsap counties (the

³² [WAC 173-26-186\(8\)\(b\)\(ii\)](#)

TACT³³ project). They identified several deficiencies in SMP implementation, including application review, permit issuance, recordkeeping, and compliance monitoring procedures. The TACT project partners—WDFW, Kitsap County, and San Juan County—have remedied several of the concerns listed below, and similar corrective actions would likely improve SMP outcomes in other jurisdictions.

- Critical project measurements, such as length, were sometimes not included on permits or in permit tracking databases. Many permit records did not include a stable reference point against which tidal elevation could be measured after the project was constructed. Such omissions make post-construction compliance monitoring difficult.
- Connecting permit information across state and local databases was challenging because of differences in how projects were named (e.g., new, repair, replacement, enhancement) and how project locations were recorded (e.g., parcel number, GPS coordinates, street address).
- Inclusion of permit conditions to reduce project impacts, such as forage fish work windows, was inconsistent because there were no formal review procedures and/or specific policies describing when those conditions are appropriate.
- Bulkhead footing (alignment) inspections often occurred after construction was complete, leaving no opportunity to fix problems with structure alignment before concrete was poured or rock was placed. Staff conducting field inspections often had no training on locating the Ordinary High Water Mark (OHWM). The reason for this lack of training was not specified.
- Local planners need more guidance and technical assistance for reviewing applicant determinations of need review (Faghin 2016). The “demonstration of need” standard and how one would achieve it on the ground are not well-defined.
 - Staff that review shore protection applications generally do not have the background or experience needed to evaluate the need for armor installation, degree of “softness” of a proposed design, or when soft-shore techniques are an option (Johannessen 2013, Barnhart et al. 2015).
 - Staff report push-back from applicants when they ask questions about geotechnical reports (Faghin 2016).
 - Marine Shoreline Design Guidelines (MSDG) tools that can be used to demonstrate need and support rigorous alternatives analysis are not being widely used in a regulatory context. Several potential explanations have been suggested: (1) lack of technical capacity necessary to prepare and review geotechnical evaluations; (2) fear of liability among local government staffers and geotechnical consultants; (3) the MSDG is not codified in local plans; and (4) there are no standardized forms for consultants to follow (Faghin 2016 and Ecology comments on NWIFC 2015, as included in PSP 2015a).

³³ Abbreviation for: Troubleshooting, Action planning, Course correction, Tracking and monitoring

- Local planners need additional implementation guidance and support (e.g., a basic tracking system) to improve implementation of the “no net loss” standard (Futurewise 2014a, NWIFC 2015, Faghin 2016). The permit system is not transparent enough to identify whether ecological impacts at the project scale are adequately addressed during permit review, or whether decisions consider the relationship of a project to loss of ecological function at a jurisdiction-wide, drift cell, or site scale (NWIFC 2015).
- Mitigation sequencing is applied inconsistently during permit review and does not appear to include compensatory mitigation adequate for reaching the no net loss standard (Futurewise 2014a). In some cases, this may be because it is not known how to compensate for some impacts (e.g., burial of spawning habitat). Planting plans are the most common form of mitigation (Barnhart et al. 2015).
- IDT members and participants at IS technical/partner workshops reported that political and manager interference with staff permit decisions is not uncommon. The pressure elected representatives face seems to be in one direction, that is to allow a homeowner to build the structure they want even if it is not SMP-compliant.
- IDT members and participants at IS technical/partner workshops reported that protective SMP permit decisions are often overturned during appeal. Many jurisdictions have limited capacity to provide third-party experts to testify during legal proceedings (Futurewise 2014c).

COMPLIANCE MONITORING AND ENFORCEMENT

- Most local jurisdictions do not have dedicated enforcement staff and are not tracking Shoreline Master Program compliance (Talebi and Tyson 2014; Futurewise 2014c; Johannessen 2013a).
- At Ecology, enforcement capability is hampered by limited resources and competing priorities like SMP updates (OCRM 2010). Political repercussions at the local level may result in jurisdictions viewing Ecology enforcement actions unfavorably.
- Talebi and Tyson’s (2014) survey of SMP implementers found that county staff were not able to produce informative compliance tracking and enforcement data.
- There is evidence that shoreline construction often occurs in the absence of or out of compliance with permits (King County 2014, Friends of the San Juans 2014, Windrope et al. 2016, Dionne et al. 2015, Barnhart et al. 2015).
 - Compliance monitoring conducted in two counties and one city found that, on average, about half of shoreline modifications did not have required permits (Kinney et al. 2015).
 - Where permits were obtained, requirements were sometimes violated in significant ways. On-site evaluations of permitted shoreline armoring projects as part of the TACT project found several structures built longer or closer to the water than was specified in permit documentation (Dionne et al. 2015).
 - The wide range of compliance rates reported can be partially attributed to variation in outcomes measured and data collection methods employed (Kinney et al. 2015).

- Inadequate compliance and enforcement programs undermine the effectiveness of SMPs (OCRM 2010, Kinney et al. 2015).
 - Interviews with county permitting staff indicate that there is widespread awareness among shoreline homeowners of lax monitoring, a lack of significant penalties, and frequent granting of “after the fact” permits (Futurewise 2014c). Landowners perceive permitting as so expensive and time consuming that some choose to forgo the process, install unpermitted armor, and face penalties (Johannessen 2013a).
 - Windrope et al. (2016) evaluated long-term performance of San Juan County’s SMP and Critical Areas Ordinance. They found a dramatic disparity between policy goals/objectives and resource outcomes. Public perception is that rules are arbitrary and applied inconsistently. Citizens had little incentive to comply with County rules—provided their neighbors were not opposed to their construction activities—given the lack of systematic enforcement (i.e., adequate authority, inspections, and financial penalties).
 - Potential barriers preventing local jurisdictions from aggressively pursuing enforcement action against violators may include the cost of legal action, political pressure, few violations identified, or heavy caseloads for local prosecutors.

EXEMPTIONS

- Several types of developments are exempted from Substantial Development Permit (SDP) procedural requirements by [WAC 173-27-040](#), including:
 - Normal protective bulkheads common to single family residences
 - Normal maintenance/repair³⁴ of existing structures
 - Emergency construction necessary to protect property from damage by the elements
- However, WAC 173-27-040 **does not** exempt proposals from SMA and local SMP standards (e.g. demonstration of need, mitigation sequencing, and no net loss). Permit-exempt development should have the same substantive review as other types of development, and local governments can condition their approval.³⁵
- Procedural differences for permit-exempt development involve:
 - Public Notice – notice to neighbors and a public comment period are not required
 - Appeals – handled by local Superior Court rather than the Shorelines Hearing Board
- Permit-exempt development is not handled uniformly among jurisdictions (ICF International 2014, Futurewise 2014a), making it difficult to generalize how reviews are conducted and documented.

³⁴ Per [WAC-173-27-040\(2\)\(b\)](#), replacement may be authorized as repair where: (1) such replacement is the common method of repair; (2) the replacement structure is comparable in size, shape, configuration, location, and external appearance; and (3) the replacement does not cause substantial adverse effects to shoreline resources or environment.

³⁵ [WAC 173-27-040\(1\)\(e\)](#). However, local permitters may not actually review exemptions in this manner.

- Some jurisdictions designate new armoring as a conditional use (ICF International 2014).³⁶ Projects authorized under a CUP require public notice at the local level, Ecology review of the local jurisdiction’s determination, and appeals go to the statewide Shorelines Hearings Board.
- Applications for repair and replacement³⁷ of existing armoring may not be receiving adequate site-specific analysis and review (NWIFC 2015). This could be related to lower permit fees for exempt projects, as described in the section on staffing levels below. Inadequate review of replacements may represent missed opportunities to work with landowners as part of the permit process to help identify alternatives that may address landowner interests and environmental improvements.
 - Repair exemptions are the most common type of authorization for shoreline armoring work. The TACT project found that 92% of permits issued in unincorporated Kitsap County and 72% of permits issued in San Juan County were for bulkhead repair (Barnhart et al. 2015). In King County, 95% of observed changes in shoreline armoring between 2004 and 2013 were repairs (King County 2014).
- IDT members and participants at IS technical/partner workshops reported that it is not uncommon for homeowners to “game the system” by improving a bulkhead after a storm event then claiming an emergency exemption.

STAFFING LEVELS

- Fees collected for permits provide a local funding stream for a city or county to run shoreline management programs. Staff levels fluctuate over time based on development trends.
- High workload and staff turnover are consistently identified as a problem during interviews with local planners (Johannessen 2013, Futurewise 2014b). These staffing challenges are most significant in smaller rural counties and small cities (T. Gates, Ecology pers. comm.).
- In many jurisdictions, the fee collected dictates how many hours staff can spend to review an application and conduct site visits/inspections. Fees for review of exempt projects may be much lower than fees for SPDs and CUPs. For example, in unincorporated Kitsap County fewer staff hours are allotted for processing exemptions compared to other types of permits (Barnhart et al. 2015).³⁸ Such a funding structure could limit the critical review

³⁶ Data from Ecology on updated and draft SMPs under review show that 14 classify shoreline stabilization as a conditional use, 12 classify it as a permitted use, and in 16 it varies by environment designation (T. Gates, Ecology pers. comm.). See Appendix A.

³⁷ Pursuant to [WAC 173-26-231 \(3\)\(a\)\(iii\)\(C\)](#), **replacement** means 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.

³⁸ This is not the case in all jurisdictions. Fees are the same for all types of SMP approvals in unincorporated King County; this may contribute to observed high rates of unpermitted repairs since a permit could cost as much as the repair itself (K. Higgins, personal communication, May 2017).

steps—including pre-application assistance, research on protected species/habitats in the project area, and site inspections—which reportedly best support strong resource protection (Futurewise 2014a, Barnhart et al. 2015, Kinney et al. 2015).

REFERENCES

Coastal States Organization. 2015. Coastal Zone Management in Washington. Accessed January 2017. http://www.coastalstates.org/wp-content/uploads/2015/09/FINAL_WashingtonFY14Factsheet_Web-1.pdf

Office of Ocean and Coastal Resource Management. 2010. Final Evaluation Findings: Washington Coastal Zone Management Program (October 2004-September 2009). National Oceanic and Atmospheric Administration. <https://coast.noaa.gov/czm/media/waevaluationn2010.pdf>

Walker, S., A.L. Brower, R.T. Theo Stephens, and W.G. Lee. 2009. Why bartering biodiversity fails. *Conservation Letters*. 2: 149-157.

Washington Department of Ecology. 1998. Enforcing the Shoreline Management Act: Guidance for Local Government Administrators. Publication Number 95-101. <https://fortress.wa.gov/ecy/publications/documents/95101.pdf>

Washington Department of Ecology. 2011. SMP Handbook (Chapter 4 – No Net Loss of Shoreline Ecological Functions). Publication #11-06-010. <http://www.ecy.wa.gov/programs/sea/shorelines/smp/handbook/Chapter4.pdf>

Washington Department of Ecology. 2016. SMP Handbook (Chapter 15 - Shoreline Stabilization). Publication #11-06-010. <http://www.ecy.wa.gov/programs/sea/shorelines/smp/handbook/Chapter4.pdf>

Washington Department of Ecology. No date. “Shoreline Master Programs Permits and Enforcement” Web Page. Accessed February 2017. http://www.ecy.wa.gov/programs/sea/sma/st_guide/administration/index.html

REGULATORY PROGRAM FACT SHEET

A.2 Hydraulic Code

AUTHORITY

Statute: [RCW 77.55.021](#) and [RCW 77.55.141](#)

Implementing regulations: [Chapter 220-660 WAC](#)

IMPLEMENTING ORGANIZATIONS

Washington Department of Fish and Wildlife (WDFW), Habitat Program

REQUIREMENTS AND APPROVALS

Washington's Hydraulic Code requires permits for certain activities in or near state waters. A Hydraulic Project Approval (HPA) is needed for work that "will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state." The sole purpose of the Hydraulic Code is to protect fish life (WDFW 2015). Its scope and geographic jurisdiction are narrower than those of the Shoreline Management Act (Figure 1). HPA decisions can be appealed, either informally³⁹ to WDFW or formally⁴⁰ to the Pollution Control Hearings Board.

ENFORCEMENT

Hydraulic Code enforcement is defined in [WAC 220-660-480](#). Formal enforcement tools include:

- Seizure of equipment – [RCW 77.15.070](#) allows WDFW enforcement officers to seize equipment if they have probable cause to believe the items were held with intent to violate the Hydraulic Code.
- Civil penalties – In most cases technical assistance⁴¹ and a notice of correction are required before violations are subject to enforcement and prosecution. Fines of up to \$100 per day can be levied.⁴²
- Criminal penalties – Under [RCW 77.15.300](#), it is a gross misdemeanor to construct a hydraulic project without a HPA or violate requirements and conditions of an HPA. Gross

³⁹ [WAC 220-660-460](#)

⁴⁰ [WAC 220-660-470](#)

⁴¹ [RCW 43.05.005](#), which is applicable to several Washington environmental protection statutes, emphasizes education and technical assistance before the imposition of penalties. Discussed further in Section 3.2.

⁴² [RCW 77.55.291](#)

misdemeanors are punishable by a fine of not more than \$1000.⁴³ County District Courts have jurisdiction for misdemeanor and gross misdemeanor violations of fish and wildlife enforcement code (Office of the Attorney General 2007). IDT members and partner/technical workshop participants indicate that HPA violations are infrequently prosecuted. However, it was not known if this because enforcement cases are not filed with local jurisdictions or if the decline to pursue the case.

FUNDING

The HPA permit program is funded primarily through the State General Fund and State Wildlife Account Fund. There has been a trend of decreasing State General Fund support for WDFW operations. In recent years, application fees (\$150 for most applicants) funded approximately 10% of the program but legislative authorization to charge fees expired. A bill introduced by WDFW during the 2017 legislative session sought to reauthorize application fees and vary the fee structure based on project complexity. The bill did not pass and as of July 1, 2017 WDFW could no longer charge application fees.

STRENGTHS

- Several program improvements have been developed and implemented to increase the transparency and consistency of HPA decisions, and address specific procedural deficiencies identified during the TACT project. These include:
 - Standardized guidelines for technical review for completeness of applications.
 - New fields in Aquatic Protection Permitting System (APPS) tracking software, including parcel number, GPS coordinates, length (existing/new), waterward extent (referencing a stable structure), and height.
 - An electronic project and site review form that provides Habitat Biologists (staff that review applications and issue HPAs) with a structured method for documenting existing habitat conditions, species at risk of impact from proposed activities, existing habitat functions, project impacts, and mitigation analysis. The electronic form is prepopulated with common parameters to assist with project determinations. A detailed user guide was prepared to support application of this tool by Habitat Biologists. Completed project forms are uploaded to the [APPS Public Portal](#), where they can be viewed by local planners and tribes reviewing the same project for SMP approval.
 - Standard operating procedures for marine bulkhead replacement that provide Habitat Biologists with standardized guidelines for processing applications, data resources, common mitigation requirements, and several rules of thumb (WDFW 2016a).
 - Improvements to the web site for applicants, including the [Technical Assistance for Better Projects](#) page.

⁴³ [RCW 9A.20.010\(2\)](#)

- Habitat Biologists are knowledgeable of priority habitats and species occurring in their assigned geographic areas. They can provide technical assistance to SMP permit reviewers regarding appropriate mitigation measures for specific project proposals. This can be particularly valuable for small jurisdictions without biologists on staff.
- The HPA program that supports field biologist visits to project sites. Not all regulatory programs have that luxury.
- A June 2016 Attorney General opinion ([AGO 2016 No. 6](#)) affirmed that WDFW's regulatory authority is not limited to activities conducted at or below OHWL.⁴⁴
- Work is underway to improve compliance and enforcement. A pilot effort for Hood Canal has been funded.
- Hydraulic Code rules were updated effective July 1, 2015. These rules, most of which had not been updated since 1994, were intended to provide better protection for fish and habitat consistent with up-to-date science and technology (WDFW 2015). Changes include:
 - [WAC 220-660-370\(6\)\(a\)](#) – allows WDFW to require establishment of permanent benchmark (i.e., fixed object like the corner of a home) against which the horizontal distance to a structure can be measured for ten years. This corrects a problem identified during field compliance monitoring conducted as part of the TACT project
 - [WAC 220-660-370\(3\)\(b\)](#) – recommends the use of the least impacting technically feasible shoreline protection alternative
 - [WAC 220-660-320\(4\)](#) – added nearshore zone geomorphic process, including feeder bluffs, as a saltwater habitat of special concern

WEAKNESSES

- Compared to SMA, the Hydraulic Code allows far less latitude to deny permit applications.
 - [RCW 77.55.141](#) requires WDFW to issue HPAs for single family marine bulkheads that meet specified criteria.⁴⁵
 - IDT members and participants at IS technical/partner workshops reported that local planners feel undermined when WDFW issues an HPA for a project that should be denied SMP approval. The local planners may not understand that Habitat Biologists do not have a choice to deny an application.
- Compared to SMA, enforcement authority is limited. The Puget Sound Tribal Management Conference (2017) recommended modification of the Hydraulic Code to enhance civil

⁴⁴ During the 2017 legislative session, a bill was introduced to restrict Hydraulic Code jurisdiction to below OHW. The status of proposed statutory changes is addressed in Section 3.4.

⁴⁵ This statute conflicts with SMA requirements for shoreline stabilization. During the 2017 legislative session, a bill which eliminated this requirement was introduced; [House Bill 1428](#) would have made the Hydraulic Code more consistent with SMA. However, the House Agriculture and Natural Resource Committee reinstated the single-family exemption in their substitute bill.

enforcement authorities by allowing WDFW to issue stop work and administrative orders, inspect properties, and increase civil fines.⁴⁶

- Alternatives analysis cannot be required for most single family residential bulkheads.⁴⁷
- WDFW cannot impose conditions that attempt to optimize conditions for fish life that are out of proportion to the impact of the proposed project.⁴⁸ Applicants cannot be required to compensate for keeping an existing structure unless it further degrades the existing baseline.
- Funding constraints limit WDFW's ability to address identified program needs, such as increasing the number of enforcement officers and establishing a dedicated code enforcement program (WDFW 2016b).

REFERENCES

Washington Department of Fish and Wildlife. 2015. Concise Explanatory Statement: Hydraulic Code Rules Update. Habitat Program. Olympia, WA.

http://wdfw.wa.gov/about/regulations/2014/wsr_15_02_029_ces.pdf

Washington Department of Fish and Wildlife. 2016a. Marine Bulkhead Replacement Standard Operating Procedure (10/13/16). Habitat Program. Olympia, WA.

Washington Department of Fish and Wildlife. 2016b. Washington's Hydraulic Project Approval Program: Report from the 2016 HPA Listening Sessions. WDFW Publication 1840.

<http://wdfw.wa.gov/publications/01840/wdfw01840.pdf>

Washington State Office of the Attorney General. 2007. Prosecutor's Manual for Fish and Wildlife Violations. Fish Wildlife and Parks Division, Olympia, WA.

[http://70.89.120.146/wapa/materials/FISHWILDLIFE Prosecutors' Manual Updated April07.doc](http://70.89.120.146/wapa/materials/FISHWILDLIFE%20Prosecutors'%20Manual%20Updated%20April07.doc)

⁴⁶ [House Bill 1428](#), introduced during the 2017 legislative session, would have increased the civil penalty to \$10,000 for every violation of the Hydraulic Code. This bill did not become law.

⁴⁷ [WAC 220-660-370\(3\)\(d\)](#), which reflects the statutory limitations imposed by [RCW 77.55.141](#)

⁴⁸ [RCW 77.55.231](#)

REGULATORY PROGRAM FACT SHEET

A.3 Clean Water Act §404 and §401

AUTHORITY

Statute: [33 U.S.C. 1344](#)

Implementing regulations: [33 CFR Part 323](#) and [40 CFR Part 230](#)

IMPLEMENTING ORGANIZATIONS

Section 404 is implemented by the U.S. Army Corps of Engineers (USACE or Corps), Seattle District, Regulatory Branch

Section 401 is implemented by Ecology, EPA, and Tribes with approved water quality standards

REQUIREMENTS AND APPROVALS

SECTION 404

Section 404 of the Clean Water Act established a program to regulate the discharge of dredged or fill material into waters of the United States. Many types of activities must receive permits under this program, including the placement of rocks, concrete, timbers, or other materials for shore protection. **Section 401** of the Act allows states and tribes with approved water quality standards to review and approve, condition, or deny federal permits within their borders.

USACE regulates discharges with a few different types of 404 authorizations:

- **Individual Permits** – For discharges with potentially significant impacts. Applications undergo a public interest review, [404\(b\)\(1\) Guidelines](#) analysis, and assessment under the National Environmental Policy Act (NEPA). Public notice is used to solicit comments and information necessary to evaluate the activity’s impact on the public interest. Processing time ranges from 6 to 12 months, or longer depending on the complexity of the project (USACE Seattle District n.d.). USACE usually cannot make a final decision on permit issuance if a state or local permit is pending.
- **General Permits** – Streamlined authorization of activities that are similar in nature and would have minimal individual and cumulative adverse effects. Public interest, 404(b)(1) and NEPA review occur programmatically. All specific terms and conditions of these permits must be met for a project to qualify. Notable national conditions relate to tribal rights (no activity may cause more than minimal adverse effects on tribal rights, protected tribal resources, or tribal lands); endangered species (consultation required for any activity that “may affect” a listed species or critical habitat); and mitigation (required to the extent necessary to ensure individual and cumulative adverse environmental effects are no more than minimal).

- **Nationwide Permits (NWP)** – Issued by USACE headquarters every five years; the most recent reauthorization was finalized in January 2017.⁴⁹ Individual districts can add regional conditions after coordination with resource agencies, tribes, and the public.⁵⁰ Generally, applicants must receive a letter from USACE verifying authorization under a NWP prior to construction. The letter of verification may include additional conditions—including mitigation—to ensure no more than minimal adverse environmental effects of actions authorized by NWPs. There are currently [52 NWPs](#); those most relevant to shoreline armoring are discussed in the next sub-section.
- **Regional General Permit (RGP)** – Authorize similar activities in a specific geographic region. Seattle District currently has [3 RGPs](#). RGP-6 (“Structures in inland marine waters”) authorizes structures such as piers, ramps, floats, and mooring buoys.

SECTION 401

Ecology, tribes (with EPA-approved water quality standards), or EPA (for tribes without approved standards) may certify that a discharge will not violate water quality standards prior to the issuance of a 404 permit. This occurs through individual **Water Quality Certifications**, or by coverage under general permits and their regional conditions.

COMPLIANCE WITH OTHER FEDERAL LAWS

Prior to authorizing an activity under an individual or general permit, USACE must ensure compliance with other Federal laws. They include:

- **Endangered Species Act (ESA) Section 7** – Requires consultation with the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) if an activity “may affect” listed species or critical habitat. USACE may add special conditions to an individual or general permit as a result of this consultation.
- **Magnuson-Stevens Fishery Conservation and Management Act** – Requires consultation with the National Marine Fisheries Service on actions that may adversely affect Essential Fish Habitat.
- **National Historic Preservation Act (NHPA) Section 106** – Requires evaluation of potential impacts to historic and/or prehistoric properties, including consultation with the State Historic Preservation Officer and Tribes. Other laws related to cultural resources may also come into play (e.g., American Indian Religious Freedom Act).
- **Rivers and Harbors Act Section 10** – Regulates activities that may obstruct navigation.
- **Coastal Zone Management Act** – Applicants must certify that the proposed project complies with the state’s approved Coastal Zone Management Program.

⁴⁹ Promulgated in a [January 6, 2017 Federal Register Notice](#).

⁵⁰ Seattle District’s final regional conditions for the 2017 Nationwide Permits can be found in their [March 17, 2017 Special Public Notice](#).

NATIONWIDE PERMITS USED FOR SHORELINE ARMORING

Activities related to installation, repair, replacement, and removal of shoreline armoring may be authorized under a variety of NWPs. Notable examples include:

- **NWP 3 (Maintenance)** – Repair, rehabilitation, or replacement of a currently serviceable structure or fill to its previously existing condition. Does not authorize any significant increase in the original structure or fill. Applicants are not required to provide improved habitat functions nor compensatory mitigation (USACE Seattle District 2017a).
- **NWP 13 (Bank Stabilization)** – Activities necessary for erosion control or prevention along no more than 500 feet of bank. Bioengineering and vegetative stabilization may be authorized.
- **NWP 18 (Minor Discharges)** – Defined as discharges of not more than 25 cubic yards below high tide line.
- **NWP 27 (Aquatic Habitat Restoration, Enhancement, and Establishment Activities)** – Discharges that result in net increases in aquatic resources function and services.
- **NWP 45 (Repair of Uplands Damaged by Discrete Events)**⁵¹ – Restoration of upland areas damaged by storms, floods, or other discrete events, including bank stabilization to protect the restored uplands. Cannot be used to reclaim lands lost to normal erosion processes over an extended period. Bank stabilization must not exceed the contours that existed before the damage occurred. Work must commence, or be under contract to commence, within 2 years of the date of damage. Does not authorize beach restoration or nourishment.
- **NWP 54 (Living Shorelines)** – This is a new NWP added in 2017 that covers bank stabilization that incorporates vegetation or other living, natural “soft” elements alone or in combination with some type of harder shoreline structure like oyster shell or rock sills. Intended for shores with small fetch and gentle slopes that are subject to low- to mid-energy waves.

APPLICATION OF NATIONWIDE PERMITS IN SEATTLE DISTRICT

Seattle District permit records for Puget Sound show more applications for repair/replacement of older structures than for new bulkheads, with most projects qualifying for NWPs (USACE Seattle District 2017a). Over the past five years (March 2012 – March 2017):

- 61 projects involving maintenance of existing bank stabilization authorized under NWP 3
- 17 projects involving new bank stabilization authorized under NWPs (average length ~120')
- 9 projects involving bank stabilization authorized by individual permits

⁵¹ [Emergency permitting procedures](#) are determined by Seattle District on a case-by-case basis. In Corps-designated emergencies, applicants may receive an emergency authorization (in hours to a week) and then obtain an after-the-fact permit. In some instances, expedited (several weeks) authorization procedures may be initiated.

This same data set reveals that 17 different NWP's were used to authorize projects involving bank stabilization: 2 (Structures in Artificial Canals), 3 (Maintenance), 7 (Outfall Structures and Associated Intake Structures), 9 (Structures in Fleeting and Anchorage Areas), 12 (Utility Line Activities), 13 (Bank Stabilization), 14 (Linear Transportation Projects), 15 (U.S. Coast Guard Approved Bridges), 18 (Minor Discharges), 25 (Structural Discharges), 27 (Restoration), 28 (Modifications of Existing Marinas), 29 (Residential Developments), 33 (Temporary Construction, Access, and Dewatering), 35 (Maintenance Dredging of Existing Basins), 36 (Boat Ramps), 39 (Commercial and Institutional Developments).

ENFORCEMENT

The Act provides both EPA and USACE with enforcement authority. Options to address violations include: no action, voluntary compliance, cease and desist orders, EPA administrative compliance orders, interim measures to protect from further damage, after-the-fact permits, administrative penalty orders, civil judicial actions, and criminal judicial actions (U.S. EPA and Department of the Army 1990). USACE takes the lead on violations involving failure to comply with terms or conditions of a Section 404 permit and some unpermitted discharges; EPA takes the lead for repeat violators, flagrant violators, where EPA requests a class of cases or a specific case, and when USACE indicates that an EPA administrative penalty action may be warranted (U.S. Army and EPA 1989). Several factors are considered when selecting an enforcement action and determining penalties, including environmental effects, economic benefit, and prior history of violations (U.S. EPA 2001). EPA can assess administrative civil penalties of up to \$10,000 per day of violation, with a maximum cap of \$125,000 (with adjustments for inflation).⁵²

FUNDING

The Corps of Engineers' operations budget funds Seattle District's Regulatory Branch. Letters of Permission, Nationwide Permits, and General Permits do not have a permit fee. Fees for Individual Permits are \$10 for individuals and \$100 for businesses. Government agencies do not pay this fee.

Costs associated with developing application materials can be quite high. Qualified professionals are needed to prepare the biological evaluations necessary for ESA consultations and archeological investigations needed for NHPA compliance.

STRENGTHS

Review under the Clean Water Act provides an opportunity for multiple agencies and tribes to contribute to assessment of project impacts and influence permit requirements necessary to avoid, minimize, and compensate for them. Even though most armoring activity is authorized

⁵² [33 U.S.C. §1319\(g\)\(2\)](#), [82 FR 3633](#)

by streamlined NWP (90% based on 2012-2017 data provided in Section 2.4.2), all projects involving new or maintenance bank stabilization activities undergo several types of review.

- Ecology requires individual 401 water quality certifications for all new armoring projects, even those authorized under NWP 13.
- Individual Endangered Species Act consultations are generally necessary, because the only programmatic consultation related to armoring in Puget Sound is limited to repair activities not exceeding 10 linear feet (NMFS and USFWS 2008).
- Seattle District has established coordination procedures with several tribes to notify and request site-specific input on proposed projects, including those under review of authorization under a NWP (USACE Seattle District 2017a).
- High fines for violators may encourage compliance.
- Participants at the technical/partner workshops reported that permit decisions are less likely to be subject to political interference, except perhaps for large port/industrial projects.

In addition, requirements for bank stabilization projects authorized under NWPs were increased during re-authorization in 2012 and 2017:

- Regional General Condition 5, added in 2017, added to submission requirements for all new bank stabilization structures. Project proponents must submit information on:
 - The cause of the erosion and the distance of any existing structures from the area(s) being stabilized.
 - The type and length of existing bank stabilization within 300 feet of the proposed project.
 - A description of current conditions and expected post-project conditions in the waterbody.
 - A statement describing how the project incorporates elements avoiding and minimizing adverse environmental effects to the aquatic environment and nearshore riparian area, including vegetation impacts in the waterbody.
 - Results from relevant geotechnical investigations describing current or expected conditions in the waterbody.

- Regional General Condition 3, added in 2012, requires individual permits for new bank stabilization in tidal waters along the eastern shore of central Puget Sound (i.e., NWP 13 is not available). This cumulative impact restriction is in place because Seattle District determined that since such a large percentage of shoreline is stabilized in this area, additional armoring would result in more than minimal adverse environmental effects (USACE Seattle District 2017a).⁵³
- Regional General Condition 10, added in 2017, is a condition relating to forage fish spawning work windows.
- NWP 54 (Living Shorelines) Specific Regional Condition stipulates that construction of breakwaters and reefs is not allowed. The national language enables these structures to extend up to 30 feet waterward of the mean low water line.⁵⁴ This NWP is also not allowed for new bank stabilization in southeastern Puget Sound (WRIAs 8-12).

WEAKNESSES

- Most new armoring is constructed above MHHW, in which case, several types of federal, state, and tribal review are not initiated.
- Restrictions on the use of NWP 13 do not apply in areas currently experiencing the highest rates of new armoring, except for portions of Pierce County.
- Some repair/replacement projects occur above MHHW, so Federal review is not initiated. Maintenance work is reviewed under 404 authority more frequently than new armoring, because bulkheads were generally built lower in the intertidal zone prior to regulatory changes made in the mid-1980s (Carmen et al. 2010).
 - It is unknown how much existing armor in Puget Sound is outside of Seattle District’s jurisdiction. Windrope et al. (2016) characterized the vertical distribution of armoring in San Juan County. Of 199 existing bulkheads evaluated, armor toe elevation was above MHHW in 90 cases (45%).

⁵³ Seattle District’s proposed 2017 Regional General Conditions revoked NWP 13 for new bank stabilization in *all* tidal waters of the Salish Sea ([June 20, 2016 Special Public Notice](#)). However, this proposal was not included in the final Regional General Conditions ([March 17, 2017 Special Public Notice](#)). Instead, Seattle District will review pre-construction notifications (PCN) for marine bank stabilization on a case-by-case basis and require individual permits where it is determined there will be more than minimal individual and cumulative adverse effects, after considering mitigation (USACE Seattle District 2017a). This determination will be based on consideration of information provided in the PCN and information obtained through ESA Section 7, tribal, NHPA Section 106, and other consultations.

⁵⁴ Seattle District’s proposed 2017 Regional General Conditions revoked NWP 54 for use in Salish Sea tidal waters entirely ([June 20, 2016 Special Public Notice](#)). There was initially concern that “Living Shoreline” techniques developed on the east and Gulf coasts for low-fetch and low-wave environments were not appropriate for use in Puget Sound. Seattle District expects that NWP 54 will not be applicable for most new bank stabilization projects in tidal waters due to high energy waves. However, it may be appropriate to permit replacement hard armoring with a living shoreline design using this permit (USACE Seattle District 2017b).

- Compensatory mitigation is not required for maintenance of existing shore protection structures under NWP 3 (USACE Seattle District 2017a).
- Permit evaluation policy codified in statute sanctions many bank stabilization activities: “Because a landowner has the general right to protect property from erosion, applications to erect protective structures will usually receive favorable consideration.”⁵⁵

8. REFERENCES

U.S. Army Corps of Engineers. 2017. 2017 Nationwide Permits, General Conditions, District Engineer’s Decision, Further Information, and Definitions. http://www.usace.army.mil/Portals/2/docs/civilworks/nwp/2017/nwp2017_general_conditions.pdf?ver=2017-04-27-084727-000

U.S. Army Corps of Engineers, Seattle District. 2017a. Supplement to the National Decision Document for 2017 Nationwide Permit 13 and Regional Conditions. <http://www.nws.usace.army.mil/Portals/27/docs/regulatory2/170420-NWPs/170420-NWS2017NWP-0013.pdf?ver=2017-04-20-181254-800>

U.S. Army Corps of Engineers, Seattle District. 2017b. Supplement to the National Decision Document for 2017 Nationwide Permit 54 and Regional Conditions. <http://www.nws.usace.army.mil/Portals/27/docs/regulatory2/170420-NWPs/170420-NWS2017NWP-0054.pdf?ver=2017-04-20-184742-223>

U.S. Army Corps of Engineers, Seattle District. No date. “Permit Guidebook” Web Page. Accessed June 2017. <http://www.nws.usace.army.mil/Missions/Civil-Works/Regulatory/Permit-Guidebook/>

U.S. Department of the Army and U.S. Environmental Protection Agency. 1989. Memorandum of Agreement Between the Department of the Army/ Environmental Protection Agency Concerning Federal Enforcement for the Section 404 Program of the Clean Water Act. <https://www.epa.gov/cwa-404/federal-enforcement-section-404-program-clean-water-act>

U.S. Environmental Protection Agency and U.S. Department of the Army. 1990. Guidance on Judicial and Criminal Enforcement Priorities. https://www.epa.gov/sites/production/files/2015-07/documents/1990_enforcement_priorities_guidance.pdf

U.S. Environmental Protection Agency. 2001. Issuance of Revised CWA Section 404 Settlement Penalty Policy. <https://www.epa.gov/sites/production/files/documents/404pen.pdf>

⁵⁵ [33 CFR 320.4\(g\)\(2\)](#)

REGULATORY PROGRAM FACT SHEET

A.4 National Flood Insurance Program: Puget Sound BiOp

AUTHORITY

Statute: [42 U.S.C. 4001 et seq.](#)

Implementing regulations: [44 CFR Parts 59-80](#)

IMPLEMENTING ORGANIZATIONS

Federal Emergency Management Agency (FEMA), and 47 participating jurisdictions (12 counties, 32 cities, and 3 Tribes) with Puget Sound marine shorelines⁵⁶

REQUIREMENTS AND APPROVALS

The National Flood Insurance Program (NFIP) is a voluntary program that provides subsidized flood insurance and other federal assistance when communities adopt land use controls in flood-prone areas. Communities become eligible for federal loans, grants, guarantees, insurance, and other assistance (e.g., flood disaster relief) when their floodplain management regulations meet or exceed FEMA's minimum floodplain management criteria.

The floodplain management criteria, codified in [44 CFR 60.3](#), largely focus on structural safety for flood damage reduction. Provisions include requirements addressing design and anchoring of buildings to prevent flotation, collapse or lateral movement; elevating buildings to or above the level of the 100-year flood; and location and design of electrical, plumbing, and other utility systems to prevent water from entering or accumulating.

FLOOD HAZARD MAPPING

An element of the NFIP particularly relevant to this analysis is flood hazard mapping. FEMA develops **Flood Insurance Rate Maps** (FIRMS) to identify flood risk zones, inform local floodplain management regulations, and communicate flood risk to a community and its residents. These FIRMS are the basis for identifying geographic areas subject to the requirements of the 2008 NFIP Puget Sound Biological Opinion. Key concepts below.

- The **floodplain** is any land area subject to inundation.
- **Base Flood Elevation** (BFE) is the computed elevation to which flood waters are anticipated to rise during the base (1% annual chance) flood event. The relationship between the BFE and a building's elevation determines the flood insurance premium.

⁵⁶ These are a subset of the 122 NFIP-participating communities in western Washington.

- **Special Flood Hazard Area (SFHA)** is the portion of the floodplain inundated by the base flood. Types of SFHA are delineated in [44 CFR 64.3](#).
 - NFIP-participating jurisdictions are required to issue permits for development within mapped SFHA.⁵⁷
 - The purchase of flood insurance is mandatory within mapped SFHA.⁵⁸
- BFEs along marine shorelines reflect the increase in water levels during a flood event due to extreme tides, storm surge, wave runup, wave overtopping, and overland wave propagation. There are two types of coastal SFHA:
 - Areas impacted by coastal flooding are designated “A” Zones
 - Coastal High Hazard Areas, designated “V” Zones, may have wave heights >3 feet
- Mapped flood hazard areas in Puget Sound can be viewed on Ecology’s [Coastal Atlas](#). As shown on Figure 1, the intertidal zone is within the SFHA even when adjacent uplands are above the BFE.
- Areas within a mapped SFHA may lie above the BFE, but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data. Development is not subject to local floodplain permitting requirements if it is located on land shown to be higher than the BFE.

THE NFIP PUGET SOUND BIOLOGICAL OPINION

Section 7 of the Endangered Species Act (ESA) requires Federal agencies to consult with the National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service (USFWS) when any action they carry out, fund, or authorize “may affect” a species listed as endangered or threatened.

FEMA initiated a Section 7 consultation for the NFIP response to a 2004 judicial order.⁵⁹ In 2008, NMFS issued a Biological Opinion (BiOp) on the impacts of the NFIP on ESA-listed species in the Puget Sound region. The BiOp concluded that continued implementation of the NFIP (1) “jeopardized the continued existence” of Puget Sound Chinook salmon, Puget Sound steelhead, Hood Canal chum salmon, and Southern Resident killer whales; and (2) would “destroy or adversely modify” critical habitat for Puget Sound Chinook salmon, Hood Canal chum salmon, and Southern Resident whales (NMFS 2008).

In the BiOp, NMFS directed FEMA to make several specific changes that would stop additional harm to these species and their habitat. One of these involved new development restrictions and mitigation requirements for inclusion in local ordinances relating to floodplain

⁵⁷ [44 CFR 60.3\(b\)\(1\) and \(2\) et seq.](#)

⁵⁸ [44 CFR 64.3\(b\)](#)

⁵⁹ [National Wildlife Federation v. FEMA](#), 345 F. Supp.2d 1151 (W.D. Wash 2004)

management.⁶⁰ The intent is to ensure city and county land use regulations and plans are sufficient to protect current critical habitat functions within the Puget Sound basin's mapped floodplain (NMFS 2011a). Participating communities must regulate future floodplain development so that it has "no adverse effect" on listed species.

Requirements most relevant to coastal floodplains are listed below; a complete list and full descriptions are provided in NMFS (2011b).

- The NFIP defines **development** as any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.⁶¹
 - The BiOp adds "removal of more than 5% of the native vegetation on the property, or alteration of natural site characteristics" to the types of activities requiring a floodplain permit in the Puget Sound region.
- Jurisdictions must prohibit most new development in the water body and adjacent **Riparian Buffer Zone (RBZ)** without submittal of a habitat assessment demonstrating that the development does "not adversely affect" salmon habitat. **Adverse effects** are changes in habitat that decrease the value of the habitat for listed species (NMFS 2011a).
 - Along marine shorelines, the RBZ extends 200 feet landward from Ordinary High Water (NMFS 2009). This RBZ overlaps with SMA jurisdiction, though the mapped floodplain may extend further inland in low-lying areas.
 - NMFS (2011a) explicitly states that bank armoring and removal of vegetation should always be assumed as "likely to adversely affect" listed species.
- Repair or remodel of existing structures is an allowed activity within the RBZ. However, structural improvements/repairs resulting in greater than a 10% increase in structure footprint must mitigate adverse effects to fish or their habitat.
- Jurisdictions must also implement standards for development beyond the RBZ, including requirements to:
 - Mitigate for any loss of floodplain storage and fish habitat.
 - Use Low Impact Development (LID) methods to minimize or avoid stormwater effects.
 - Mitigate for any indirect adverse effects to riparian vegetation, channel migration, large woody debris, hyporheic zones, wetlands, etc.
 - Limit new impervious surfaces within the floodplain to >10%, unless mitigation is provided.

⁶⁰ Since NFIP is a voluntary program applied as local floodplain management regulations, participating jurisdictions have the responsibility of implementing BiOp standards in their local land use codes (Olson 2013). A 2014 judicial ruling affirmed that local jurisdictions are obligated to implement the BiOp's development restrictions to maintain good standing in the NFIP. See [National Wildlife Federation v. FEMA et al.](#) (Case No. C11-2044-RSM).

⁶¹ [44 CFR 59.1](#)

- Limit removal of native vegetation so that 65% of the surface area of the portion of the lot within the floodplain is in an undeveloped state.
- Set back structures (i.e., buildings) at least 15-feet from the RBZ.

LOCAL IMPLEMENTATION OF BIOP REQUIREMENTS

FEMA developed three compliance pathways for communities to meet these requirements:

- **Door 1** – Adopt a Model Ordinance (FEMA 2012) created to meet BiOp standards.
- **Door 2** – Demonstrate that existing or amended regulations/plans, such as Shoreline Master Programs and Critical Areas Ordinances, provide protections equivalent to the BiOp standards. Communities selecting this option can (1) use the Checklist for Programmatic Compliance (FEMA 2013a) or (2) prepare a Programmatic Habitat Assessment (FEMA 2013b) to demonstrate how they meet or exceed the requirements. This compliance pathway requires verification and approval by FEMA. Mitigation for impacts is allowed only under Door 2.
- **Door 3** – Review permit applications on a case-by-case basis. This compliance pathway requires a Habitat Assessment for every floodplain development permit application.⁶² FEMA (2013b) provides habitat assessment and mitigation guidance/training. Mitigation for impacts is not allowed under Door 3.

Affected jurisdictions were originally given a deadline of September 2010 to demonstrate compliance, but the deadline was extended to September 2011 due to widespread confusion about the complex BiOp requirements and needs for more detailed implementation guidance (Olson 2013, MRSC 2016).

Door 2 is the preferred compliance option because the project-by-project approach may fail to capture all effects of incremental development (NMFS 2011a). Jurisdictions that adopt Door 2 can commit to restoration activities on a larger scale to offset unavoidable adverse effects on a local or parcel-by-parcel scale (NMFS 2011a). Several jurisdictions have submitted materials for Door 2 compliance, but in some cases documents remain under review (MRSC 2016). When a jurisdiction is waiting for approval of a Door 2 submittal, they default to Door 3.

Hyatt (2016) concluded that the complex BiOp requirements are being applied unevenly among jurisdictions. FEMA has provided technical support, but no financial assistance to aid communities in complying with BiOp requirements (Olson 2013). Smaller jurisdictions and those that issue few floodplain development permits may be resource-constrained and more likely to struggle to demonstrate compliance.

⁶² When a proposed development requires an ESA consultation to obtain a 404 permit, that consultation can be used to demonstrate compliance with the BiOp.

IMPLICATIONS FOR SHORELINE ARMORING PERMITTING

The NFIP BiOp adds a layer of habitat protection that exceeds the requirements of local shoreline master programs, and full implementation should advance protection of marine shorelines substantially (Hyatt 2016). The intertidal and RBZ are to be “no-disturbance zones” where current habitat functions are protected and further degradation is not allowed.

NFIP communities are required to demonstrate to FEMA that any proposed development within the RBZ does not adversely affect protected species and their habitat. Some jurisdictions continue to issue permits for new shoreline stabilization that do not meet this standard. Lack of technical expertise in developing and reviewing habitat assessments appears to be a limiting factor for some jurisdictions (M. Carey, FEMA, pers. comm.).

Communities must comply with BiOp requirements to remain NFIP-eligible. The consequences of a community not remaining in good standing are codified in [44 CFR 59.24](#):

- [Probation](#) – FEMA-imposed change in a community’s status resulting from violations and deficiencies in the administration and enforcement of NFIP local floodplain management regulations. When a community is placed in probation, an additional charge of \$50.00 will be added to the premium for every policy in the jurisdiction for a period of at least 1 year.
- [Suspension](#) – FEMA’s removal of a NFIP participating community from the program because the community has not enacted and/or enforced the proper floodplain management regulations required for participation. When a community is suspended, new flood insurance cannot be purchased and existing policies cannot be renewed. Other benefits for participating communities—including Federal loans and grants for development, Federal disaster assistance, and Federal mortgage insurance or loan guarantees within identified flood hazard areas—are also disallowed.

A change in community standing would affect so many constituents that there is potential for the BiOp to reduce political interference that sometimes occurs during SMP permit decisions. The ramifications of non-compliance may be serious enough to alter the current dynamic where pressure from elected officials and/or department heads is applied to prevent staff from implementing SMPs as written. Technical/partner workshop participants described this pressure as always being one way (i.e., to issue permits that should be denied) and attributed it to complaints from individual homeowners. Non-compliance with the BiOp would affect all flood policy holders⁶³ in the jurisdiction, rather than a few individual homeowners aggrieved by

⁶³ The number of flood policy holders is significantly higher than the number of applicants for new bulkheads. FEMA (2015) indicates there were **926 flood policies** in force in Kitsap County (4 cities, 2 tribes, and unincorporated areas) as of November 2015. Barnhart et al. (2015) found **9 permit applications for new bulkheads** in Kitsap County (unincorporated areas only) during their review of 5 years of permit records.

permit conditions or denial, providing elected officials with an incentive to support tough regulatory decisions.

REFERENCES

Federal Emergency Management Agency. 2012. Floodplain Management and the Endangered Species Act: A Model Ordinance. Region 10 Mitigation Division, Bothell, WA.

https://www.fema.gov/media-library-data/1383597893424-4747f702310a2bbc7e04ea83d66f73f5/NFIP_ESA_Model_Ordinance.pdf

Federal Emergency Management Agency. 2013a. Floodplain Management and the Endangered Species Act: Checklist for Programmatic Compliance. Region 10 Mitigation Division, Bothell, WA.

https://www.fema.gov/media-library-data/1383597499829-c4d2a589c8ae1463357c1cac8d043ce7/NFIP_ESA_Biological_Opinion_Checklist.pdf

Federal Emergency Management Agency. 2013b. Floodplain Habitat Assessment and Mitigation: Regional Guidance for the Puget Sound Basin. Region 10 Mitigation Division, Bothell, WA.

https://www.fema.gov/media-library-data/1383598118060-e34756afe271d52a0498b3a00105c87b/Puget_Sound_R10_Habitat_Assess_guide.pdf

Federal Emergency Management Agency. 2015. Risk Report for Kitsap County. Risk MAP Program, Bothell, WA.

http://www.kitsapdem.org/pdfs/Risk_Report_-_Kitsap_County_-_Final.pdf

Hyatt, T. 2016. The FEMA BiOp – Underutilized Potential for Shoreline Protection. Oral presentation at the 2016 Salish Sea Ecosystem Conference.

<http://cedar.wvu.edu/ssec/2016ssec/shorelines/14/>

Municipal Research and Services Center. 2016. Options for Compliance with the National Flood Insurance Biological Opinion. Web page accessed May 2017.

[http://mrsc.org/Home/Explore-Topics/Public-Safety/Emergency-Services/Flood-Hazard-Management-Planning-\(1\)/The-National-Flood-Insurance-Program-and-the-Impac/Options-for-Compliance-with-the-National-Flood-Ins.aspx](http://mrsc.org/Home/Explore-Topics/Public-Safety/Emergency-Services/Flood-Hazard-Management-Planning-(1)/The-National-Flood-Insurance-Program-and-the-Impac/Options-for-Compliance-with-the-National-Flood-Ins.aspx)

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2008. Programmatic Biological Evaluation for 10 Activities in the State of Washington – Minor Bank Stabilization Repair. Endangered Species Act Section 7 Consultation with U.S. Army Corps of Engineers, Seattle District. http://www.nws.usace.army.mil/Portals/27/docs/regulatory/ESA_Phase_I_SPIFs-PBEs/PBE_Minor_Bank_Stabilization_Repair_2008.pdf

National Marine Fisheries Service. 2008. Endangered Species Act - Section 7 Consultation Final Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Implementation of the National Flood Insurance Program in the State of Washington, Phase One Document – Puget Sound Region.

https://www.fema.gov/media-library-data/20130726-1900-25045-9907/nfip_biological_opinion_puget_sound.pdf

National Marine Fisheries Service. 2009. Second Notice of Error and Correction to Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the on-going National Flood Insurance Program carried out in the Puget Sound area in Washington State. May 14, 2009 letter from Steven W. Landino to Mark Eberlein. https://www.fema.gov/media-library-data/20130726-1900-25045-3665/nfip_biological_opinion_puget_sound_erratta2.pdf

National Marine Fisheries Service. 2011a. Implementation Standards for the NFIP Biological Opinion's Reasonable and Prudent Alternative. September 26, 2011 letter from William W. Stelle Jr. to Kenneth Murphy. <http://mrsc.org/getmedia/6B2E4868-0F49-478D-A9D5-5BFD457F9647/m58nfip9262011.aspx>

National Marine Fisheries Service. 2011b. Reasonable & Prudent Alternative Element 3: Floodplain Management Criteria. NFIP Biological Opinion summary memo. https://www.fema.gov/pdf/about/regions/regionx/NMFS_RPA.pdf

Olson, M. 2013. Fish and Floods: Implementation of the 2008 biological opinion on the National Flood Insurance Program in Washington State. Masters thesis. https://digital.lib.washington.edu/researchworks/bitstream/handle/1773/22778/Olson_washington_02500_11542.pdf?sequence=1&isAllowed=y

INCENTIVE PROGRAM FACT SHEET

A.5 Shore Friendly

IMPLEMENTING ORGANIZATIONS

Kitsap County, San Juan County, San Juan CD, Island County, Mason CD, WSU Extension, Futurewise, and Washington Sea Grant

FUNDING

NEP grants (Marine and Nearshore LO) funded formative research/strategy development (2012); [website](#) development/hosting (2015); and pilot campaigns in Island, Mason, San Juan, and Kitsap (2014). Four grants (Marine and Nearshore LO) for Phase II campaigns (2016) are ongoing.

TYPES OF INCENTIVES OFFERED

Financial, technical assistance, permitting assistance, recognition

PROGRAM OVERVIEW

Colehour + Cohen et al. (2014a) applied social marketing⁶⁴ techniques to develop a framework for motivating residential shoreline landowners to voluntarily choose alternatives to hard armor (Table 6). The project team developed a Puget Sound parcel database to categorize properties by armor status, erosion potential, and presence/absence of homes (Colehour + Cohen et al. 2014b). Data from surveys, interviews, and focus groups was used to identify target behaviors, barriers, and motivations for different parcel categories (Colehour + Cohen et al. 2014c). Specific incentive tools and messaging strategies were then developed to encourage preferred armoring behaviors among landowners and their influencers.⁶⁵ These tools and messages were refined using focus groups, and then a how-to-guide was developed to provide local jurisdictions and influencer organizations step-by-step instructions for planning,

⁶⁴ **Social marketing** applies traditional marketing principles to influence behavior change in target audiences. This approach differs from traditional community outreach and education programs in that it focuses on identifying and addressing barriers to action (PSP 2015b). Formative research is a key element of social marketing. Once barriers to and motivators for desired actions are known, targeted incentive tools can be applied to achieve specific behavior changes. Social marketing is a rigorous, evidence-based approach that has been used for decades to improve public health.

⁶⁵ **Influencers** are people who provide information to property owners when they are making shoreline modification decisions. They include: realtors, contractors, county permitting/outreach staff, neighbors, conservation district staff, and NGO staff.

TABLE A.2.2 “Shore Friendly” social marketing framework

Target Audience	Desired Behavior(s)	Barriers	Motivations	Potential Incentive Tools
<p>Parcels with no armor</p> <p>52% of residential parcels</p> <p>Common in Kitsap, Mason, Pierce, King</p>	Leave shore unarmored	Concern about erosion storms, waves, or tides changing shoreline	<ul style="list-style-type: none"> - Being confident their property would be protected or enhanced - Enjoying the natural look - Providing healthy habitat for fish and wildlife 	<ul style="list-style-type: none"> - Free erosion assessment - Certified contractor program - Workshops - Peer-to-peer outreach - Ambassador (single point of contact for questions, referrals, and assistance) - New homeowner visits/packets - Stewardship recognition and awards
<p>Parcels with armor and no to moderate erosion risk</p> <p>46% of residential parcels</p> <p>Common in Island, San Juan, Kitsap</p>	<ul style="list-style-type: none"> - Remove armor - Replace with soft shore, if needed 	Concern about erosion	Being confident their property would be protected or enhanced	<ul style="list-style-type: none"> - Free erosion assessment - Certified contractor program - Workshops - Peer-to-peer outreach - Ambassador - New homeowner visits/packets
		Expense of removing armor	Tax break or reduced fees loan or grant	<ul style="list-style-type: none"> - Property tax break - Grants - Loans - Group rates for neighborhoods - Free or discounted design services - Free or discounted permitting - Stewardship recognition and awards
		Complicated permitting process	Streamlined permitting	<ul style="list-style-type: none"> - Special restoration permits - Help with permit applications - Certified contractor program

Armor removal and soft shore alternatives are generally less feasible for the remaining 2% of parcels due to high erosion potential.

developing, implementing, and evaluating the effectiveness of a Shore Friendly campaign (Colehour + Cohen et al. 2014d).

CURRENT STATUS

Shore Friendly campaigns are currently being implemented in San Juan, Kitsap, Island, and Mason counties. Phase I projects (2014-2016) are complete, and Phase II projects (2016-2018) are underway. They are being led by either county departments or conservation districts, often with partners such as WSU Extension, Washington Sea Grant, Futurewise, and private contractors.

The four Phase I campaigns developed programs tailored to local needs, so each had a slightly different emphasis. In some cases, focus groups and key messenger interviews were conducted. Training for both landowners and influencers occurred to varying extents; influencer training targeted real estate agents, contractors, or arborist depending on the county. Some campaigns focused on properties with armor, while others prioritized unarmored properties.

OUTCOMES

Island County (2016), Mason CD (2016), San Juan County (2016), and Shore Friendly Kitsap Planning Team (2016) summarize Shore Friendly campaign outputs between 2014 and 2016:

- 6 landowner workshops reached 92 participants (Mason)
- 3 boat tours, one of which targeted elected officials
- 3 contractor trainings with a total of 68 participants
- 5 trainings for 124 real estate professionals (San Juan and Island)
- 7 presentations at realtor offices, reaching 106 real estate professionals (San Juan)
- 13 staff from 5 Puget Sound Conservation Districts received training on providing shoreline technical assistance
- 8 citizen volunteers trained as Shore Friendly Ambassadors (Kitsap)
- Collaboration with county permit offices to streamline permitting for soft shore and restoration projects (San Juan, Kitsap, and Island)
- 125 preliminary site visits
- 128 technical site visits (with assessment reports)
- 19 landowners received design services for armor removal and/or softening projects
- 11 landowners received permitting assistance for armor removal and/or softening projects
- 7 landowners received reduced cost or free permits (Kitsap and Island)
- 23 landowners in Kitsap and Mason received mini-grants for project implementation (projects involved armor removal, native plantings, drainage improvements)
- 467 feet of armor removed as part of 6 projects (Kitsap)

Two NTA proposals for further expansion of Shore Friendly programs to Pierce/Thurston (NTA 2016-0172) and King/Snohomish/Pierce (NTA 2016-0236) counties were submitted but have not been funded.

STRENGTHS

- Service area includes 4 of the 6 Puget Sound counties with the highest rates of armoring.
- Messaging and incentive tools can be tailored to meet local needs.
- Focus on influencer outreach.
- Financial incentives provided for project implementation in Kitsap and Mason.

WEAKNESSES

- Lack of a long-term funding source.
- Lack of financial incentives for project implementation was noted as a problem in San Juan.
- Some geographic overlap with other programs (e.g., SHARP, Green Shores for Homes).

REFERENCES

Colehour + Cohen, Applied Research Northwest, Social Marketing Services, Futurewise, and Coastal Geologic Services. 2014a. Shore Friendly Final Report. Prepared for the Washington Department of Fish and Wildlife and the Washington Department of Natural Resources.

Colehour + Cohen, Applied Research Northwest, Social Marketing Services, Futurewise, and Coastal Geologic Services. 2014b. Puget Sound Shoreline Parcel Segmentation Report. Prepared by A. MacLennan, J. Waggoner, and J. Johannessen for the Washington Department of Fish and Wildlife and the Washington Department of Natural Resources.

Colehour + Cohen, Applied Research Northwest, Social Marketing Services, Futurewise, and Coastal Geologic Services. 2014c. Research Synthesis and Audience Map. Prepared by Applied Research Northwest for Colehour + Cohen, the Washington Department of Fish and Wildlife and the Washington Department of Natural Resources.

Colehour + Cohen, Applied Research Northwest, Social Marketing Services, Futurewise, and Coastal Geologic Services. 2014d. Social Marketing How-To-Guide for Shore Friendly Campaign Implementers. Prepared by Colehour + Cohen for the Washington Department of Fish and Wildlife and the Washington Department of Natural Resources.

Island County. 2016. Final Report for Landowner Incentives to Reduce Puget Sound Shoreline Armoring in Island County. Report to the Marine and Nearshore Grant Program by A. Toledo, Island County Department of Natural Resources.

Mason Conservation District. 2016. Shore Friendly Mason Final Report. Report to the Puget Sound Marine and Nearshore Grant Program.

Shore Friendly Kitsap Planning Team. 2017. Shore Friendly Kitsap: A Project to Incentivize Voluntary Removal of Waterfront Bulkheads, Phase I Final Report. Report to the Marine and Nearshore Grant Program prepared by J. Adams, K. Barnhart, R. Johnson, C. Kereki, K. Mesebeluu-Yobech, K. Peters, and H. Trim.

INCENTIVE PROGRAM FACT SHEET

A.6 Shoreline Armoring Reduction Program

IMPLEMENTING ORGANIZATIONS

Northwest Straits Foundation (NWSF), Snohomish Marine Resource Committee (MRC),⁶⁶ Island MRC, San Juan MRC, Whatcom MRC, Skagit MRC, Jefferson MRC, and Clallam MRC

FUNDING

Three NEP grants (Marine and Nearshore LO) funded program development and 2012-2018 operating costs. The 2016-2018 grant is ongoing.

TYPES OF INCENTIVES OFFERED

Technical assistance, permitting assistance

PROGRAM OVERVIEW

The NWSF's [Shoreline Armoring Reduction Program](#) (SHARP) offers several services within their seven-county service area:

- Free “Living with the Coast” workshops that cover coastal and beach processes; how to manage beach and bluff erosion; alternatives to hard armoring; benefits of bulkhead removal or reduction; and managing vegetation and drainage for slope stability.
- Free shoreline site assessments by licensed coastal geologists/engineers for [qualified](#) landowners. Post-visit summary reports provide homeowners with information about erosion potential and management options. Participants are encouraged to invite their neighbors to allow for evaluation of multiple adjacent parcels.
- Engineering design services and assistance through the permitting process are provided for some sites where an assessment indicates a bulkhead can be removed or replaced with soft-shore protection. Landowner cost-share may be required for these services.

The SHARP program is an expansion of a pilot targeted outreach project the NWSF conducted in the Port Susan Marine Stewardship Area. A landowner needs assessment (Johannessen 2012) and technical assistance program (Johannessen 2013b) were conducted in two counties as part of that effort.

⁶⁶ [Marine Resource Committees](#) are county-based committees of volunteers appointed by their local elected officials. They identify priorities for local marine resources protection; advise their county governments on marine resources issues and policies; and implement a variety of restoration, protection, monitoring, and outreach projects.

OUTCOMES

Overview of SHARP program outputs between 2012 and 2016:

- 17 landowner workshops reached 627 participants
- 132 technical site visits
- 9 landowners received design services for armor removal and/or softening projects
- 5 landowners received permitting assistance for armor removal and/or softening projects
- Secured funding (NEP grant through Habitat SI) to proceed with Maylor Point armor removal project (1500 linear feet) via NTA 2016-0088.⁶⁷ Sought NTA funding for three additional armor removal projects (total 1071 linear feet).
- Conducted a county planner needs assessment and coastal training session for SMP implementers in Snohomish and Island counties.

STRENGTHS

- MRCs are established as a trusted resource in 7 Puget Sound counties. Outreach network well-developed.
- NWSF has experienced staff with proven success at obtaining grant funding, securing permits, and managing construction projects.
- Strong citizen science network available to collect monitoring data before and after armor removal.

WEAKNESSES

- Lack of a long-term funding source.
- SHARP does not provide financial incentives for project construction. NWSF (2016) noted that few landowners were motivated to engage in the process if they had to pay for the full cost of armor removal. NWSF has sought grant funding for project implementation through the NTA process, Salmon Recovery Funding Board, and Estuary and Salmon Restoration Program.
- Service area excludes 5 Puget Sound counties, 3 of which have had the highest rates of new armoring in recent years (Mason, Pierce, and Kitsap).

⁶⁷ **NTAs or “near term actions”** are proposed programs, projects, investigations, or other actions intended to advance Puget Sound recovery. They are the core of the Implementation Plan component of the [2016 Action Agenda Update](#). Information on the fall 2015 solicitation, subsequent review process, and ranked lists of NTAs can be found on PSP’s [2016 Near Term Action Proposals website](#). The [next NTA solicitation](#) will occur in November 2017, with proposal review and ranking scheduled for April-July 2018.

REFERENCES

Johannessen, T. 2012. Summary of Needs Assessment for Targeted Outreach to Shoreline Landowners in the Port Susan Marine Stewardship Area. Prepared for the Northwest Straits Foundation by EE Outcomes Consulting.

Johannessen, T. 2013a. *Targeted Outreach to Reduce Impacts from Shore Armor in the Port Susan Marine Stewardship Area: County Planner Needs Assessment and Workshop Summary Report*. Prepared for the Northwest Straits Foundation by EE Outcomes Consulting.

Johannessen, T. 2013b. *Targeted Outreach to Reduce Impacts from Shore Armor in the Port Susan Marine Stewardship Area: Program Assessment Summary Report*. Prepared for the Northwest Straits Foundation by EE Outcomes Consulting.

Northwest Straits Foundation. 2016. Landowner Incentives to Reduce Puget Sound Armoring: Final Report for Project #14-01929. Prepared for the Marine and Nearshore Grant Program.

INCENTIVE PROGRAM FACT SHEET

A.7 Conservation District Shoreline Programs

IMPLEMENTING ORGANIZATIONS

12 Conservation Districts that are part of the Puget Sound Conservation Districts Caucus, and the Washington State Conservation Commission (WSCC)

FUNDING

Public and private grants, direct contracts, and some Districts are authorized to receive property taxes via special assessments⁶⁸ or fixed rates and charges⁶⁹

TYPES OF INCENTIVES OFFERED

Technical assistance, financial, permitting assistance

PROGRAM OVERVIEW

Conservation Districts (CDs) are local government entities that work directly with private landowners to voluntarily preserve and enhance natural resources. Their boundaries generally, but not always, follow county lines. Specialized CD staff work one-on-one with individuals in a collaborative, non-regulatory context. They can provide project designs, guidance for finding contractors and consultants, financial assistance, and construction oversight.

Marine shorelines have not historically been a focus for CD technical assistance programs (Mason CD 2016). Until recently, no Puget Sound CDs had developed technical support programs for marine shoreline properties like those available to agricultural and freshwater properties. NEP grant funding led to development of “Shore Friendly” programs housed at Mason and San Juan⁷⁰ CDs (described further in Section 4.3). King CD developed a “Where the Water Begins” program targeting marine shorelines.

The [Puget Sound Conservation Districts Caucus](#) submitted a NTA proposal (NTA 2016-0268) to expand these programs to Pierce, Thurston, and Snohomish counties, and build additional inter-CD technical capacity. Mason CD submitted a similar proposal (NTA 2016-0172) that

⁶⁸ [RCW 89.08.400](#)

⁶⁹ [RCW 89.08.405](#)

⁷⁰ San Juan County’s Community Development Department transferred responsibility for Shore Friendly grant implementation to the San Juan CD in 2016.

included expansion to Pierce and Thurston counties, as well as collaboration with land trusts to develop conservation easement tools. Neither of these proposals have been funded.

STRENGTHS

- CDs are long-established as a trusted resource in all 12 Puget Sound counties.
- Staff have extensive experience managing natural resource programs and implementing projects with private landowners.
- Dedicated operations funding is available in counties where CDs are authorized to collect property taxes (King, Mason, Pierce, San Juan, Snohomish, Thurston, and Whidbey).
- In 2013, the Puget Sound Conservation District Caucus signed an Interlocal Agreement that enables member Districts to share financial resources, technical expertise, and staff.

WEAKNESSES

- CDs have not traditionally focused on marine shorelines, so expertise on coastal processes and engineering may be lacking.
- Demand for engineering services is higher than staff capacity. NTA 2016-0268, which has not been funded, included an expansion of financial support for WSCC's engineering cluster.

INCENTIVE PROGRAM FACT SHEET

A.8 Green Shores for Homes

IMPLEMENTING ORGANIZATIONS

Washington Sea Grant and Islands Trust (British Columbia)

FUNDING

A NEP grant (FY2010 Watershed Management Assistance Program) funded program development and pilot implementation. Washington Sea Grant has provided gap funding on a limited basis.

TYPES OF INCENTIVES OFFERED

Recognition, permitting assistance

PROGRAM OVERVIEW

Green Shores for Homes (GSH) provides information, tools, and support to waterfront property owners, designers, and construction professionals to help minimize the environmental impact of waterfront residential development. Once enrolled in the program, shoreline projects are assessed against a series of credits for which a homeowner can achieve points. Projects are rated by neutral third-party verifiers that have been trained by Washington Sea Grant (Canadian partners handle this task in British Columbia).

GSH is modeled after the LEED™ and Built Green™ rating programs. These types of programs are tools to reduce the environmental impact of the build environment; transform the development industry; and serve as an educational tool for builders and property owners (Emmett et al. 2017).

The GSH [credit and rating system](#) was developed by an interdisciplinary team of scientists, regulators, and practitioners (Green Shores for Homes 2015). The credit system rewards practices such as wider setbacks, removal of bulkheads or groins, soft shore techniques, tree and snag preservation, riparian buffer plantings, impervious surface minimization, removal of creosote material, and establishment of conservation easements. Projects can achieve one of two recognition levels depending on the number of credits awarded. The GSH1 or “Chinook” level corresponds to recognizable improvement/conservation of the natural features and processes of the shoreline. The GSH 2 or “Orca” level recognizes exceptional design regarding improvement/conservation of natural shoreline features and processes.

The City of Kirkland is a GSH Community and uses the rating system to determine project eligibility for expedited permitting. The City of Seattle is evaluating how to become a GSH Community. Mason and San Juan counties have taken steps towards establishing the program in their communities.

STRENGTHS

- The GSH credit system provides a standardized, quantitative way to determine if a soft shore project is “soft” enough to go through expedited permitting where available.
- The GSH credit system provides points for climate change adaptation action under the building setback and managed retreat credits (Emmett et al. 2017).
- No other program is pursuing development of a list of accredited professionals.

WEAKNESSES

- Lack of a long-term funding source.
- Program is in the pilot stage. Local government champions are needed to move to a fully operational program (Emmett et al. 2017). NTA 2016-1219 sought grant funding for developing technical assistance, design/permitting services, and financial incentives; implementing additional pilot projects; and working with additional local jurisdictions to use GSH in conjunction with the shoreline permitting process. It has not been funded.

REFERENCES

Emmett, B., D.G. Blair, and N. Faghin. 2017. Green Shores: Using Voluntary Ratings and Certification programs to Guide Sustainable Shoreline Development. *In* Bilkovic, D., M. Mitchell, M. La Peyre, and J. Toft (eds.). *Living Shorelines*. Boca Raton: CRC Press.

Green Shores for Homes. 2015. *Credits and Ratings Guide, Version 1*.

http://greenshoresforhomes.org/wp-content/uploads/2015/12/GreenShores_Credits-Ratings_Guide-2015-121.pdf

INCENTIVE PROGRAM FACT SHEET

A.9 WSU Extension Shoreline Programs

IMPLEMENTING ORGANIZATIONS

WSU Extension locations in 12 Puget Sound Counties

FUNDING

U.S. Department of Agriculture Cooperative State Research, Education, and Extension Service; state match; county government⁷¹ (direct and in-kind); grants and contracts; fee-for-service

TYPES OF INCENTIVES OFFERED

Education, recognition

PROGRAM OVERVIEW

WSU Extension programs provide informal education to meet locally-identified needs. The Extension system was initially authorized in 1914 to diffuse useful and practicable information related to agriculture and home economics.⁷² Extension programs have adapted to changing times and natural resources are now a major focus area. WSU Extension has offices in all 12 Puget Sound counties, and offer a variety of programs including Master Gardener, Sustainable Agriculture, 4-H Youth Development, Noxious/Invasive Species, Energy, Watershed Stewardship and Rain Gardens. Specific programs offered are determined by the priorities and needs of the community, resources available, and expertise of local faculty (Lindstrom 2007).

Several Puget Sound Extension offices offer programs targeting marine shorelines. The [Shore Stewards](#) program educates and engages shoreline property owners about home and landscape management activities that protect and improve shoreline function. WSU Extension provides guidelines (e.g., [Guide for Shoreline Living](#)), workshops, booths at community events, a web-based clearinghouse of local resources in each county, and bi-monthly [newsletters](#). This program is currently supported in Island, Jefferson, Kitsap, Mason, and Skagit counties.

Extension staff also coordinate training of citizen volunteers through the Beach Naturalists and Beach Watchers programs in Snohomish, Jefferson, and Kitsap counties. After training, these volunteers participate in outreach and research efforts, such as beach naturalist days, youth

⁷¹ Per [RCW 36.50.010](#), Extension is a non-mandated service funded at the discretion of the county governing body. County partners provide support staff, office space, and operating funds (Lindstrom 2007).

⁷² [7 U.S.C. §341](#)

field trips and classroom lectures, storm drain marking, recreational crabber education, water quality monitoring, and beach characterization.

WSU Extension has developed a real estate course covering shoreline property characteristics, regulations and permits, development and redevelopment strategies, and market considerations. The curriculum has been approved by the Department of Licensing for 7.5 clock hours of continuing education for real estate professionals. This course has been offered in collaboration with Shore Friendly programs in Island and Kitsap Counties.

STRENGTHS

- Established network of faculty/educators with experience executing and managing community-based programs.
- Presence in every Puget Sound county, though not all have programs related to marine shorelines.
- Encourages peer-to-peer learning with their extensive network of trained citizen volunteers.
- Frequent collaborators with county/city departments, CDs, Washington Sea Grant, MRCs, and others. Involved with Shore Friendly implementation in Mason and Kitsap counties.
- Shore Stewards programs focuses on whole-property stewardship and includes education on issues beyond shoreline stabilization, including water quality, on-site septic systems, and landscape management.

WEAKNESSES

- Lack of funding needed to expand Shore Stewards programs region-wide. WSU Extension submitted three NTA proposals to expand services to counties it is not currently able to serve due to a lack of funding (NTAs 2016-0104, 0106, 0267). They have not been funded.

REFERENCES

Lindstrom, J.H. 2007. The relationship among Washington State county commissioners' knowledge and perceptions of Washington State University Extension and their willingness to fund WSU Extension. Dissertation, University of Montana.
<https://pqdtopen.proquest.com/doc/304842164.html?FMT=ABS>

INCENTIVE PROGRAM FACT SHEET

A.10 Neighborhood Salmon Conservation Easement Program

IMPLEMENTING ORGANIZATIONS

San Juan Preservation Trust and Friends of the San Juans

FUNDING

Grants from the Salmon Recovery Funding Board, Puget Sound Acquisition and Restoration Program, National Fish and Wildlife Foundation, private foundations, and San Juan County

TYPES OF INCENTIVES OFFERED

Financial

PROGRAM OVERVIEW

The Neighborhood Salmon Conservation Easement Program was a pilot project to develop and explore landowner interest in new conservation easement tools specifically for waterfront properties. The easement instrument produced as part of this project differs from standard easements in two ways: (1) it covers multiple adjacent residential properties located within a coastal process unit (e.g., drift cell or pocket beach) rather than a single property; and (2) it includes specific conservation prescriptions for the shoreline zone, as opposed to customary language that addresses only upland activities.

The grant-funded work, which ended in 2015, had four components:

- Acquisition planning – Targeted process units with feeder bluffs and forage fish spawning beaches located within priority salmon areas identified during salmon recovery planning efforts, primarily Beamer and Fresh (2012) and Whitman et al. (2012).
- Landowner outreach/engagement – Conducted neighborhood beach walks, community workshops, and technical expert site visits to explore level of interest. More than 500 homeowners were reached by mail, and over 100 participated in events (Friends of the San Juans 2015).
- Development of neighborhood shoreline easement tools – New conservation prescription language was developed, multi-owner documents underwent legal review, and mechanisms for implementation (escrow, etc.) were developed. The easement instrument addresses protection of the shoreline zone (areas 200 feet inland from OHW) with conditions to maintain marine riparian vegetation and prohibit shoreline alteration, armoring, filling, and permanent structures. Easements are conveyed in perpetuity and is transferred with title to all future owners.

- Valuation research – Terra Valuations (2015) was contracted to explore methods for assessing potential diminution of property value associated with the perpetual use restrictions that do not decrease residential density.

The project resulted in permanent protection through easement of three adjacent shoreline parcels (33 acres with 1,500 linear feet of shoreline), as well as the shoreline zone of four adjacent parcels (7 acres with 1,500 linear feet of shoreline) on Waldron Island. Negotiations with two other groups of landowners continued after the end of the grant period.

STRENGTHS

- Conservation easements on small parcels are difficult to administer and typically lack conservation values to warrant the effort. Working with multiple property owners along important stretches of beach could enhance the overall habitat value of individual easements (Clausen 2016).
- This project integrated parcel-scale protection with landscape-scale processes. It provides an excellent example of how to link locally-driven salmon recovery prioritization work with incentive efforts.
- This project introduced a financial incentive that could be incorporated into regional incentive programs. Conservation easements can be used to encourage homeowners to keep their property unarmored permanently and as a mechanism to compensate for the cost of armor removal/softening projects. Only one of the proposed NTAs for incentive program expansion included participation of land trusts (NTA 2016-0172 for Shore Friendly Pierce/Thurston).

WEAKNESSES

- Lack of dedicated funding to finance easement acquisition.

REFERENCES

Clausen, D. 2016. Neighborhood Shoreline Conservation Easements. Oral presentation at the 2016 Salish Sea Ecosystem Conference. <http://cedar.wvu.edu/ssec/2016ssec/shorelines/19/>

Friends of the San Juans. 2015. Final Report for Project #11-1560: SJC Neighborhood Salmon Conservation Easement. Submitted to the Washington Recreation and Conservation Office. <https://secure.rco.wa.gov/prism/search/ProjectSnapshotAttachmentData.aspx?id=241205>

Terra Valuations, LLC. 2015. Shoreline Conservation Easement Valuation Study: An Exploratory Framework for Assessing the Value Impact of Shoreline Conservation Easements on a Neighborhood Scale. Prepared for Friends of the San Juans and the San Juan Preservation Trust. <https://secure.rco.wa.gov/prism/search/ProjectSnapshotAttachmentData.aspx?id=238857>

Whitman, T., A. MacLennan, P. Schlenger, J. Small, S. Hawkins, and J. Slocomb. 2012. Strategic salmon recovery planning for San Juan County Washington: the pulling it all together (PIAT) project. Prepared by Friends of the San Juans, Coastal Geologic Services, Confluence Environmental and Anchor QEA for the SJC Lead Entity for Salmon Recovery and the Washington State Salmon Recovery Funding Board. Final report RCO #10-1789.

http://www.sanjuans.org/documents/whitmanetal_Final_PAT_2012.pdf

APPENDIX B: DEFINITIONS

<u>B.1 Tidal Datums and Regulatory Boundaries</u>	<u>B-1</u>
<u>B.2 “Soft Shore” Protection Techniques</u>	<u>B-2</u>

B.1 Tidal Datums and Regulatory Boundaries

Mean Lower Low Water (MLLW)

(1) The average of the lower low water height of each tidal day observed over the National Tidal Datum Epoch (a specific 19-year period determined by the National Ocean Service).

(2) Also refers to a vertical reference datum, or base elevation from which relative heights or depths are measured. When elevations are reported/mapped in the MLLW datum, the numerical value of the MLLW mark is always zero.

Mean Higher High Water (MHHW)

The average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch. Numerical values vary by location within Puget Sound, generally increasing to the south. Jurisdictional boundary selected by Seattle District for Clean Water Act Section 404 permits.

Highest Astronomical Tide (HAT)

The highest level of water which can be predicted to occur under any combination of astronomical conditions. This level may not be reached every year.

Ordinary High Water Mark (OHWM)

Per [RCW 90.58.030\(2\)\(c\)](#): 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. In salt water areas where the OHWM cannot be found, the mean higher high water tidal elevation is used. The landward jurisdictional boundary of the Shoreline Management Act references OHWM.

Ordinary High Water Line (OHWL)

Per [RCW 77.55.011\(16\)](#): The mark on the shores of all water 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 ordinary years as to mark upon the soil or vegetation a character distinct from the abutting upland. In any area where the ordinary high water line cannot be found, the ordinary high water line adjoining saltwater is the line of mean higher high water. The Hydraulic Code requires permits for activities that affect the natural flow or bed of state waters below OHWL.

Mean Sea Level (MSL)

The arithmetic mean of hourly heights observed over the National Tidal Datum Epoch. The waterward boundary of mapped floodplains under National Flood Insurance Program.

Base Flood Elevation (BFE)

The computed elevation to which floodwater is anticipated to rise during a 100-year flood. The landward boundary for mapped floodplains under National Flood Insurance Program.

B.2 “Soft Shore” Protection Techniques

This following table was developed at the request of the IDT. It illustrates the variability in descriptions of “soft shore” stabilization in guidance and regulatory documents.

Source	Definitions
Marine Shoreline Design Guidelines (Johannessen et al. 2014)	<p>Armor: Rigid, permanent design techniques used to stabilize shorelines and prevent erosion</p> <p>Soft shore protection: shore protection design which entails the use of indigenous materials such as gravel, sand, logs, and root masses in designs that have some degree of flexibility, mimicking natural processes.</p>
Soft Shoreline Stabilization: SMP Planning and Implementation Guidance (Gianou 2014)	<p>Soft stabilization techniques: Incorporate natural materials (e.g., sand, gravel, large wood, native plants) in a design that minimizes impacts to natural processes. The intent of soft shoreline stabilization projects is to balance the need to control erosion while also maintaining and enhancing shoreline ecological functions.</p> <p>Hard armoring techniques: Use hard materials such as large rock, concrete, or steel in designs that alter the shoreline configuration and severely limit natural processes. Hard structures are static.</p> <p>Hybrid stabilization techniques: Incorporate more artificial structural elements than soft stabilization techniques and have more environmental impact.</p> <p>Shoreline stabilization continuum: There is an array of shoreline stabilization possibilities ranging from natural, undisturbed shorelines with no stabilization features to heavily armored shorelines with little to no resemblance to the original shoreline. Soft shoreline stabilization lies between natural and hard armored shoreline conditions. Hard structures can have some soft attributes, and soft projects sometimes can have some hard elements. One must consider how projects meet the intent of soft shorelines to clarify what may not be considered soft shore line stabilization.</p>
WAC 173-26-231 – Shoreline modifications (SMA)	<p>"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:</p> <ul style="list-style-type: none"> • Vegetation enhancement; • Upland drainage control; • Biotechnical measures; • Beach enhancement; • Anchor trees; • Gravel placement; • Rock revetments; • Gabions; • Concrete groins;

	<ul style="list-style-type: none"> • Retaining walls and bluff walls; • Bulkheads; and • Seawalls. <p>Generally, the harder the construction measure, the greater the impact on shoreline processes, including sediment transport, geomorphology, and biological functions.</p>
WAC 220-660-370 – Bank protection in saltwater areas (Hydraulic Code)	<p>The common alternatives below are in order from most preferred to least preferred:</p> <ul style="list-style-type: none"> (i) Remove the bank protection structure; (ii) No action - Control upland drainage; (iii) Protect, enhance, and replace vegetation; (iv) Relocate improvements or structures; (v) Construct a soft structure by placing beach nourishment and large woody material; (vi) Construct upland retaining walls; (vii) Construct a hard structure such as bulkhead and rock revetment landward of the OHWL; (viii) Construct a hard structure such as a bulkhead and rock revetments at the OHWL.
Kitsap County SMP – Section 22.150.570 (2014)	<p>Shoreline Stabilization: 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, for example, include approaches such as building setbacks, structure relocation, groundwater management, and land use planning. Structural methods can be “hard” or “soft.”</p> <p>“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 bioengineering vegetation measures or beach enhancement. “Hybrid” structures are a composite of both soft and hard elements along the length of the armoring. Generally, the harder the construction measure, the greater the impact on shoreline processes including sediment transport, geomorphology, and biological functions.</p> <p>There are a range of measures for shoreline stabilization, varying from soft to hard that include, but are not limited to:</p> <p>A. Soft</p> <ul style="list-style-type: none"> 1. Vegetation enhancement; 2. Beach enhancement; 3. Bioengineering measures; 4. Anchor logs and stumps; and 5. Gravel placement/beach nourishment. <p>B. Hard</p> <ul style="list-style-type: none"> 1. Rock revetments; 2. Gabions; 3. Groins; 4. Bulkheads; and 5. Seawalls.

<p>Island County SMP – Section 17.05A.070 (2016)</p>	<p>Non-Structural Shoreline Stabilization: Shoreline erosion control and restoration practices using only plantings or organic materials to restore, protect, or enhance the natural shoreline environment. Focus on the use of woody plants and limited structural-mechanical systems that are integrated in a structurally and environmentally sound manner to repair and protect slopes against shallow mass wasting and surface erosion. At least eighty percent (80%) of the stabilization project must be constructed of naturally-occurring materials used in ways that are consistent with current nearshore processes. Measures such as live stake, live fascine, brushlayer, live cribwall, vegetated geogrid, branchpacking, and live slope grating are examples of soft shore protection techniques. Also called bioengineering or soft shore stabilization.</p> <p>Shoreline Stabilization: Structures or modifications for the purpose of retarding shore erosion from wave or current action, protecting channels and harbors from wave action, encouraging deposition of beach materials, or preventing shoreline overflow and retaining uplands. Shoreline stabilization may consist of bulkheads, seawalls, dikes, revetments, breakwaters, jetties, groins, gabions, large woody material placement, beach nourishment, vegetation enhancement, biotechnical methods, or similar structures or modifications.</p> <p>Structural Shoreline Stabilization: Shoreline stabilization that includes placement of riprap, fitted stone, poured-in-place or precast concrete, driven wood or metal piles, or other similar hard armoring.</p>
<p>Jefferson County SMP – Article 2 (2015)</p>	<p>Shore armoring or structural shoreline armoring refers to the placement of bulkheads and other hard structures on the shoreline to provide stabilization and reduce or prevent erosion caused by wave action, currents and/or the natural transport of sediments along the shoreline. Groins, jetties, breakwaters, revetments, sea walls are examples of other types of shoreline armoring.</p> <p>Shoreline stabilization means non-structural modifications to the existing shoreline intended to reduce or prevent erosion of uplands or beaches and/or influence wave action, currents and/or the natural transport of sediments along the shoreline. This includes use of bioengineering and other forms of vegetative stabilization.</p>
<p>San Juan County SMP – Sections 41 and 45 (locally adopted, under review by Ecology)</p>	<p>Soft structural shoreline stabilization measures: flexible defense works constructed of natural materials such as bioengineering alternatives (those incorporating trees, shrubs and other living components), beach nourishment, protective berms, and vegetative stabilization</p> <p>Hard structural shoreline stabilization measures: rigid structures constructed of materials such as sandbags, wood retaining walls, rock, or concrete</p> <p>Soft shoreline stabilization projects may include hard structural shoreline stabilization elements if need to tie in with hard structural shoreline stabilization measures on adjacent properties.</p>

<p>Mason County SMP – Section 17.50.020 (2016 draft)</p>	<p>Bioengineering: Techniques used alone or in combination such as beach nourishment, coarse beach fill, gravel berms, or vegetation rather than hard surfaces such as concrete armoring. Bioengineering approaches may include use of large woody debris.</p> <p>Bulkhead: Retaining wall-like structures whose primary purpose is to hold or prevent sliding of soil caused by erosion and wave action, and to protect uplands and fills from erosion by wave action.</p> <p>Revetment: A sloped wall constructed of rip rap or other suitable material placed on stream banks or other shorelines to retard bank erosion from high velocity currents or waves respectively.</p> <p>Rip Rap: Dense, hard, angular rock used to armor revetments or other flood control works.</p> <p>Shoreline Stabilization (or “bank stabilization”): Actions taken to address erosion impacts to property and dwellings, businesses, or structures caused by processes such as current, flood, tides, wind, or wave action. These actions include a range of methods from “hard” structural methods such as bulkheads, and “softer” nonstructural methods such as bioengineering.</p>
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