

Washington Shellfish Initiative – Phase II Work Plan

Washingtonians make hundreds of thousands of trips each year to harvest razor clams on the coast. Tribal governments and their people have harvested shellfish for generations upon generations, feeding their communities with healthy protein from Puget Sound and coastal shores. The shellfish industry is a foundation of Western Washington’s rural economy and an important part of our state’s heritage. Washington leads the nation in farmed shellfish production with approximately 10,500 metric tons of oysters, clams and mussels in 2013, which generated approximately \$184 million in total economic contribution, of which almost \$92 million was direct revenue from the industry. Washington shellfish growers also directly employed more than 1,900 employees and created more than 810 indirect and induced jobs across the state. Our shellfish are sought by consumers around the world and are a well-deserved source of pride for local growers. Shellfish are also a key part of our marine ecosystems, providing habitat and helping filter and cleanse water. For all of these reasons, shellfish are an extraordinary resource to Washington state.

The Washington Shellfish Initiative began in late 2011. The first state initiative in the nation, it was launched on the heels of the National Oceanic and Atmospheric Administration’s National Shellfish Initiative. This effort supports the long-term goal of enhancing shellfish resources in coastal waters. Much has been accomplished through the Washington Shellfish Initiative, including water quality improvements to support recreational, tribal ceremonial, subsistence, commercial and nontribal commercial harvest, a new native shellfish restoration hatchery, cutting-edge science to monitor ocean acidification and an assessment of the state aquaculture permitting process.

The goals laid out in the Washington Shellfish Initiative from 2011 are ambitious and vital to the long-term and sustained health of shellfish resources and the marine ecosystem. While important steps have been taken in the past four years, we need to continue advancing these goals to ensure clean water; address ocean acidification; establish predictable, timely and protective permitting processes; restore native shellfish to the nearshore habitat; and educate and engage communities about shellfish resources and protecting water quality.

The following work plan describes the next steps in advancing toward these Washington Shellfish Initiative goals. It outlines plans, partners and timelines to map our future.

GOAL 1: ENSURE CLEAN WATER TO PROTECT AND RESTORE SHELLFISH GROWING AREAS IN PUGET SOUND AND ON THE COAST¹.

1.1 Support sustainable local nonpoint source pollution control programs and strategies. (DOH, ECY, WSCC, WSDA)

Protect shellfish beds in counties with significant shellfish resources. Recognize the extensive economic and tribal cultural importance of the state’s shellfish harvest and that it is more cost effective to protect healthy resources than to restore them once they are polluted.

Restore shellfish beds where there is a significant number of shellfish acres that have been downgraded due to pollution originating in contributing watersheds and that need to be recovered for commercial, ceremonial, subsistence and recreational purposes. ([DOH National Estuary Program Pathogen Grant Implementation Strategy](#) provides a framework for protecting and restoring shellfish growing areas. See Page 38 for a table of restoration efforts by growing area. Note that growing areas downgraded after 2012, such as Portage Bay, are not listed.) Advance the goals of protecting and restoring shellfish growing areas through the [Results Washington](#)² goals and processes, in addition to a broad range of local, state, federal, tribal, nonprofit and citizen-based efforts.

¹ Throughout this document, the term “coast,” in the context of locations, refers to Willapa Bay, Grays Harbor and the outer coast –Washington’s Pacific shoreline.

- a) Support comprehensive, sustainable pollution identification and correction (PIC) programs in the 14 counties³ that have shellfish growing areas. Evaluate PIC programs by identifying what it takes for effective coordination, identifying best practices for source identification, correcting the pollution problems identified as necessary to meet water quality standards, including National Shellfish Sanitation Program (NSSP)⁴ standards over shellfish growing areas, identifying sources of sustainable and supplemental grant funding, and addressing barriers that reduce the effectiveness of local and multi-agency efforts. (DOH)
- b) Develop and implement effective total maximum daily load water cleanup plans (TMDLs) or a straight to implementation (STI) plans for fecal coliform bacteria in watersheds with shellfish growing areas. (ECY)
 - Identify and implement strategies to address outer coast beach bacterial sources along North Beach in Grays Harbor County, including: 1) outreach and education to improve understanding of water quality problems; 2) increase capacity of local jurisdiction to address wastewater infrastructure improvements; and 3) implement appropriate best management practices.
 - Revisit TMDLs in the watersheds such as the Lower Nooksack River and Samish and update implementation plans based on new information and data.
- c) Support the development of strong sustainable, on-site sewage management programs in Puget Sound and on the coast by implementing the Puget Sound Septic Financing Advisory Committee's recommendations to:
 - Pursue agency request legislation to provide a sustainable funding source for local on-site sewage management programs, which may include PIC work for the Puget Sound. (DOH)
 - DOH, Ecology and local health jurisdictions will work together to create a regional, low-interest loan program to help system owners repair and replace failing systems for the Puget Sound and the coast through Ecology's water quality combined funding program. (DOH, ECY)
 - Pursue other recommendations of the advisory committee when alternative approaches are needed.
- d) Implement agricultural land use pollution reduction strategies to maximize implementation and maintenance of best management practices (BMPs) to meet water quality standards, including National Shellfish Sanitation Program (NSSP) standards at shellfish growing areas. (WSCC, WSDA, ECY, DOH) Use the Results Washington process to open shellfish acreage by conducting analyses of current efforts and addressing barriers to develop strategic, effective approaches that result in meeting water quality standards, including the achievement of NSSP standards in shellfish growing areas.

² Results Washington is Governor Inslee's data-driven continuous improvement system for state government. Using Lean tools, Results Washington works to make government more efficient, effective and transparent. The Shellfish Coordination Group was formed as part of the Sustainable Energy & Clean Environment goal. This group focuses on the Governor's goal of restoring and protecting approved shellfish growing areas by 1) assessing what's truly going on; 2) identifying barriers towards progress; and 3) bringing state agencies together to address those barriers.

³ Counties with shellfish growing areas are Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Mason, Pacific, Pierce, San Juan Skagit, Snohomish, Thurston and Whatcom.

⁴ The National Shellfish Sanitation Program (NSSP) is the federal/state cooperative program recognized by the U. S. Food and Drug Administration and the Interstate Shellfish Sanitation Conference for the sanitary control of shellfish produced and sold for human consumption. The NSSP water quality standard for approved shellfish growing waters is a fecal coliform geometric mean not greater than 14 organisms/100 mL with an estimated 90th percentile not greater than 43 organisms/100 mL.

- Each agency providing funding to implement agriculture BMPs to protect water quality affecting shellfish beds will, consistent with Results Washington process outcomes, a) report on the BMPs implemented and funds spent in Puget Sound and coastal communities, and b) collaborate to maximize landowner participation in programs to gain broad compliance with water quality standards including NSSP standards in shellfish growing areas.
- Seek funding for additional technical assistance and implementation costs.
- Evaluate current and past pollution reduction strategies and funding programs to determine what is effective, what is not effective and why. Coordinate across federal, tribal, state and local partners. Use results to inform future strategies.
 - › Efforts will focus initially on the Samish and Nooksack watersheds as long-term water quality efforts have not resulted in sufficient and sustained water quality improvements.
- Identify an agreed-upon approach to develop PIC guidance on nonpoint source BMPs that prevent pollution, achieve water quality standards and maximize landowner participation. Washington needs agreed-upon agricultural BMPs that are designed and implemented to achieve compliance with the state water quality standards. Since 2009, state agencies and stakeholders have worked to reach agreement on a set of BMPs that will meet state water quality standards and ensure that NSSP standards are achieved in shellfish growing areas. It is important for those dependent on shellfish resources in this state that the state's natural resource agencies, in coordination with stakeholders, resolve this issue.
- Ecology is starting a process to develop guidance that identifies BMPs and combinations of BMPs that, if implemented by an agricultural producer and operated and maintained correctly, can provide certainty that it is protecting water quality and meeting the state's water quality standards. (ECY)
- Conduct a detailed survey on the coast to identify where agricultural activities are occurring, evaluate resource impacts, assess where nonpoint source pollution programs are working effectively and where not, and then develop and implement outreach. (WSCC)
- Implement the Voluntary Stewardship Program (VSP) in the opt-in counties of Grays Harbor, Mason, Pacific, San Juan, Skagit and Thurston and encourage counties to address nonpoint sources of pollution while addressing critical areas under VSP to assist with shellfish/water quality protection. (WSCC)
- Seek input from Ecology's Agriculture Water Quality Committee on strategies developed under this section.

1.2 Advance efforts to ensure manure land-application practices do not negatively impact water quality. (WSDA, WSCC, ECY, EPA)

- a) Develop and advance options to eliminate unplanned and improper application of manure to agricultural lands. (WSDA, WSCC, ECY)
- b) Develop more economic opportunities for dairies and other livestock owners to manage manure as a commodity. (WSDA)
- c) Issue an updated concentrated animal feeding operation permit in 2016 to meet water quality standards and expedite the permit process. (ECY)

- d) Coordinate state agency efforts to enhance the ability of operators and applicators to get real-time weather information. (WSCC, CDs)
- e) Develop a targeted, coordinated education and outreach program for small-acreage livestock property owners. (WSCC, ECY, WSDA)
- f) Develop an education and certification program for all land applicators of manure (operators and third-party applicators) and provide incentives for operators to become certified and/or to only use certified applicators. (WSDA)
- g) Deploy advance technologies that can continuously detect and measure bacteria in flowing surface waters in watersheds where shellfish beds are impacted by water quality. (EPA)
- h) Collaborate with local watershed partnerships to monitor water quality and identify manure land application practices that threaten surface water. Follow up with land applicators to provide education and technical assistance and, when necessary, take appropriate enforcement actions. (WSDA)

1.3 Develop a proactive approach to limit preventable pollution sources from vessels and recreational activities. (ECY, Parks)

- a) Evaluate the appropriateness and feasibility of establishing a no discharge zone in all parts of Puget Sound to protect water quality and public health. (ECY)
- b) Develop a strategy for commercial vessels and install more commercial pump-out facilities. (ECY)
- c) Develop an implementation/outreach strategy for the no discharge zone designation. (ECY)
- d) Continue clean vessel program focused in shellfish growing areas. (Parks)
- e) Assess, prioritize, install and maintain toilet facilities in key areas to protect shellfish resources. (WDFW, Parks, other partners depending on location)

1.4 Support strategies to reduce sewer and stormwater outfalls to waters of the state. (DNR)

DNR, in collaboration with ECY, DOH and PSP, will implement an outfall and effluent reduction strategy to reduce impacts to state-owned aquatic lands and associated resources from sewer and stormwater discharges. The strategy will focus on greater participation in the National Pollutant Discharge Elimination System process by DNR; identification and prioritization of impacts to sediments and natural resources such as aquatic vegetation and shellfish; and alternatives to discharging wastewater and stormwater to improve water quality.

1.5 Coordinate and convene workshop(s) focused on contaminants in shellfish with agencies, researchers, tribal governments and stakeholders. (WDFW)

- a) Identify available data and information relating to contaminants in shellfish.
- b) Identify data gaps and prioritize needed information, including geographic areas where information is lacking.
- c) Identify potential resources, collaborative opportunities and funding sources to support further information and data gathering.

1.6 Ensure that oil spill planning and preparedness protect Puget Sound and coast shellfish resources through better coordination and collaboration among agencies, tribal governments and industry. (ECY, NOAA, PSI, WSG, DOH, WDFW)

- a) Improve the identification of shellfish areas in the resources at risk sections of geographic response plans (GRPs) and in other relevant mapping tools such as ERMA®– (Environmental Response Management Application) and the state’s coastal atlas by developing standardized language for shellfish for inclusion in GRPs and links to appropriate GIS layers for shellfish growing and harvest areas and for culturally significant areas to the tribal governments. (ECY)
- b) Generate and distribute a “how to” guide to increase registration of shellfish growers and tribal fishers/enforcement personnel in the vessels of opportunity program. (ECY)
- c) Encourage participation by shellfish growers and tribal governments in northwest area contingency planning processes so area plans address shellfish-specific responses. (ECY)
- d) Increase the availability of HAZWOPER (Hazardous Waste Operations and Emergency Response) and incident command system training for shellfish growers and tribal governments to improve knowledge of spill response fundamentals (funding dependent). (PSI, WSG, ECY)
- e) Include tribal governments and shellfish growers in oil spill response drills as appropriate. Conduct at least one oil spill response drill within a geographic area including one or more shellfish beds by 2017. (ECY)
- f) Establish a plan for baseline monitoring of shellfish in vicinity of a spill, including early notification to area shellfish harvesters by agency staff to collect samples before contaminated by oil. (DOH, WDFW, ECY)
- g) Determine training options for local sensory panel experts for post-spill testing hosted by NOAA’s Office of International Affairs and Seafood Inspection. (NOAA)
- h) Clarify the protocol to request support from sensory experts and share sensory panel results from federal to state agencies in a timely manner. (NOAA)

GOAL 2: EMBRACE STRATEGIES TO ADDRESS OCEAN ACIDIFICATION’S IMPACT ON SHELLFISH.

Strategies to address ocean acidification – Implement key early action recommendations from the Blue Ribbon Panel (ECY)

In 2012, the Washington State Blue Ribbon Panel on Ocean Acidification recommended 42 actions that established a comprehensive strategy for addressing ocean acidification in Washington. [The Marine Resources Advisory Council](#) (MRAC) was created to advance these recommended actions, and works in collaboration with the Washington Ocean Acidification Center at the University of Washington and others to support ocean acidification research. MRAC will ensure on-the-ground implementation of the panel’s comprehensive strategy by evaluating, coordinating, advocating and communicating about actions being done in Washington. MRAC will work with stakeholders, policymakers and tribal governments, many of whom are already working to address ocean acidification impacts to their communities and way of life. Over the next few years, MRAC will:

2.1 Monitor and investigate ocean acidification impacts in Washington:

- a) Continue monitoring of ocean acidification conditions, helping to inform hatchery conditions and management of growing areas (related to Blue Ribbon Panel actions 6.2.1; 7.1.1; 7.2.1; 7.3.2; 7.4.1).

- b) Conduct biological experiments to understand the effects of ocean acidification on marine species (related to Blue Ribbon Panel actions 7.1.1; 7.2.1; 7.3.2; 7.4.1).
- c) Develop and refine forecast models of ocean acidification (related to Blue Ribbon Panel actions 7.1.1; 7.2.1; 7.3.2; 7.4.1).
- d) Continue support for the Washington Ocean Acidification Center at the University of Washington to provide leadership on ocean acidification research (related to Blue Ribbon Panel actions 9.1.1; 9.1.2).
- e) Develop a local source attribution model to understand how local sources of nutrients and carbon impact ocean acidification (related to Blue Ribbon Panel action 7.2.1).

2.2 Understand how local, land-based contributions affect ocean acidification by:

- a) Providing support to water quality programs that reduce nutrient and organic carbon loading (related to Blue Ribbon Panel actions 5.1.1; 5.1.2).
- b) When modeling tools are complete, evaluate programs and activities that can minimize impacts of local contributions to ocean acidification (related to Blue Ribbon Panel actions 5.2.1; 5.2.2).

2.3 Coordinate implementation and evaluation of adaptation and remediation strategies by supporting efforts to:

- a) Implement a test seaweed cultivation and collection program (related to Blue Ribbon Panel action 6.1.1).
- b) Restore native oyster populations that may improve resilience to ocean acidification (related to Blue Ribbon Panel actions 6.3.3; 6.3.4).
- c) Apply multiple remediation strategies in specific locations or test areas to evaluate effectiveness of strategies in addressing ocean acidification impacts (related to Blue Ribbon Panel action 6.3.2).
- d) Research the capacity for genetic adaptation to ocean acidification in important marine species (related to Blue Ribbon Panel action 6.3.5).

2.4 Increase the visibility and understanding of ocean acidification across Washington through outreach and education by supporting efforts to:

- a) Incorporate ocean acidification science curriculum into the Next Generation Science Standards (related to Blue Ribbon Panel actions 8.2.1; 8.2.2).
- b) Organize and support events and conferences focused on ocean acidification and its impacts (related to Blue Ribbon Panel action 8.1.2).
- c) Target use of outreach and social marketing to increase understanding of ocean acidification impacts and strengthen Washington's capacity for adapting, reducing harm locally and engaging partners to develop solutions (related to Blue Ribbon Panel actions 8.1.2; 8.1.3; 8.1.4; 8.2.2).

Recommendations from the Olympic Coast National Marine Sanctuary, which formed a joint Intergovernmental Policy Council and Sanctuary Advisory Council Ocean Acidification Working Group in 2013, identified the following key early actions (KEAs) from the Blue Ribbon Panel as coastal tier 1 priorities: Actions 7.1.1; 7.3.2; 7.3.3; 8.1.2 and 9.1.2. This KEA prioritization is accompanied in its report by the following recommendations:

- Advance ocean acidification monitoring for the outer coast.
- Adequate representation of the outer coast on the Washington Ocean Acidification Center scientific advisory team.

- Conduct laboratory and field studies related to ocean acidification impacts on the outer coast.

For the full report, visit: http://olympiccoast.noaa.gov/involved/sac/sac_actions.html.

GOAL 3: ADVANCE VITAL SHELLFISH RESEARCH.

3.1 Washington Sea Grant shellfish research projects (WSG)

Over the next four years, the National and Washington Sea Grant (WSG) programs have committed funding for 10 research grants totaling more than \$2.4 million to examine critical issues for shellfish aquaculture such as ocean acidification, warning systems for hypoxia and harmful algal blooms, and geoduck management. Projects will look at precautionary guidelines for culture of native rock scallops, an innovative technology to support the recovery of the Olympia oyster and studies to reduce early mortality.

Target dates:

- *New projects initiated: January 2015 and 2016*
- *Interim reports: April 2016 and 2017*
- *Final reports: April 2018*

3.2 Federal Shellfish Research Program (NOAA)

In collaboration with other federal agencies, NOAA Fisheries will create a federal shellfish biologist position to develop and oversee a future shellfish research program at the Kenneth K. Chew Center for Shellfish Research and Restoration in Manchester, Washington.

Target date: October 2017

3.3 Study the effects of Washington shellfish aquaculture operations. (WSG)

WSG was funded by the Legislature to commission research examining possible negative and positive effects, including cumulative and economic impacts of evolving Washington shellfish aquaculture practices. The research team is using modeling approaches and available data to complete pilot studies for Willapa Bay and central Puget Sound composed of several components: spatial analysis, Puget Sound circulation and ecosystem models, qualitative food web analyses and an economic synthesis.

Target dates

- *Interim report to Legislature: December 2014*
- *Final report: December 2015*

3.4 Create a prioritized list of shellfish research needs. (Pacific Shellfish Institute [PSI])

Target dates:

- *Engage the shellfish cultivation and restoration community, including tribal governments, to update the report West Coast Research and Information Needs and Priorities*
 - › *September 2015 and March 2016*
- *Finalize the document: June 2016*

3.5 Assess the potential effects of sea level rise on native and farmed shellfish beds in Willapa Bay and Grays Harbor estuaries. (TNC)

SLR will deepen these estuaries and could impair shellfish farming as well as juvenile fish habitat. The Nature Conservancy (TNC) will conduct a risk assessment based on SLR inundation scenarios using the Sea Level Affecting Marshes Model and analyze shoreline characteristics and uses that would impede or support migration to new spaces. Apply the results to the current round of shoreline master program (SMP) updates in Pacific and Grays Harbor counties so adaptation strategies can be considered.

Target dates:

- *Work with Ecology staff and county planners and consultants to develop the concept and its role in SMPs for Southwest Washington: December 2014*
- *Draft risk assessments with presentation slides and maps go to technical peers for initial review: March 2015*
- *Review initial results with local shellfish farmers and other industry representatives: April 2015*
- *Final assessments available for local applications: June 2015*

3.6 Early warning system for harmful algal blooms (WSG, NOAA)

The Olympic Region Harmful Algal Blooms (ORHAB) Partnership on the coast and SoundToxins in Puget Sound are important programs that help the Department of Health target its toxin monitoring and testing to protect public health for those who harvest shellfish in our marine waters.

SoundToxins is a diverse partnership of businesses, tribal governments and Puget Sound residents that monitor for harmful algae in Puget Sound, managed by NOAA's Northwest Fisheries Science Center and WSG. It provides early warning of harmful algal bloom (HAB) events, thereby minimizing risks to human health and reducing the economic losses to Puget Sound fisheries. The program works with partners and scientists to determine the environmental conditions that promote the onset and flourishing of HABs and unusual bloom events and to document unusual bloom events and species entering the Salish Sea. SoundToxins continues to be supported via short-term research grants from NOAA and state agencies; however, a dedicated source of funding is needed to continue its vital role in Puget Sound.

The ORHAB partnership was founded in 1998 as a scientific collaborative among state, tribal and federal agencies and the University of Washington, with initial support from the NOAA Center for Sponsored Coastal Ocean Research. Its mission is to monitor plankton blooms and the presence of toxins to advance the understanding of these important coastal processes. By bringing together leading research scientists with state and tribal shellfish managers, ORHAB provides a constantly improving scientific basis for making decisions about the risks of shellfish openings. The long-term, coastwide database compiled by the ORHAB partners from sites from Neah Bay to the Long Beach Peninsula has proved extremely useful for studying broader coastal dynamics. The work of ORHAB's state partners has been supported with a surcharge on sales of state recreational shellfish licenses. Support for ORHAB's tribal partners has become more difficult to sustain, and additional funding is needed to continue the very beneficial role they play in the partnership.

Target Dates:

- *Identify potential funding sources for SoundToxins and ORHLAB: March 2016*
- *Secure funding: December 2016*

3.7 Review and research shellfish ecosystem services (PSI)

- a) Assess the influence of cultivated shellfish on localized water quality and sediment parameters. Build on review of shellfish ecosystem services conducted by the U.S. Geological Services during the first phase of the Washington Shellfish Initiative.
- b) Provide recommendations for including shellfish cultivation in water quality trading scenarios when a water body is listed for excess nutrients or low dissolved oxygen under section 303(d) of the Clean Water Act.

Target dates:

- *Begin study: spring/summer 2015*
- *Study completed: early 2017*
- *Deliver NEP Reducing Nutrients in a Watershed final project report to Ecology: December 2017*

3.8 Assess the economic contribution of shellfish farming and wild harvest in Washington.

- a) Convene state agencies and industry to design a system to improve data collection and sharing of information on the economics of shellfish with respect to harvest and production. (state agencies, industry, tribal governments)
- b) Convene a task group to enhance our understanding of the upstream and downstream economic value of shellfish to build appreciation of the value-added economic components (jobs, revenue) (WDFW) including, but not limited to:
 - retail sales
 - tourism
 - trade
 - tribal commercial
 - state commercial and recreational harvest

In addition, tribal governments and their citizens rely on ceremonial and subsistence shellfish harvest. Like tribal commercial harvest, this harvest is protected through treaty rights. The monetary value of ceremonial and subsistence harvest and associated treaty rights cannot be quantified, but should be acknowledged by the task group.

3.9 Promote collaborative, ecosystem-based management in Willapa Bay and Grays Harbor.

Willapa Bay and Grays Harbor are complex estuarine ecosystems that support wild stocks of finfish and Dungeness crab and a historic shellfish aquaculture industry, as well as a rich array of other species. Management challenges at the system scale, such as SLR, ocean acidification, nutrient and sediment transport, burrowing shrimp and Japanese eelgrass, are affecting both natural and anthropogenic processes. Resolving these challenges requires adaptive management and collaborative actions built on a commonly shared understanding of how the ecosystems function, how they have changed over time and what future conditions may be like. The steps below will promote cooperative, system-scale management by compiling and synthesizing information and addressing important information gaps:

- a) Compile, synthesize and maintain historical data, management plans and research findings relevant to system-scale management challenges in Willapa Bay and Grays Harbor, focusing on how these ecosystems function, how they have changed over time and projections of changes that can affect management options. Make the information available via a purpose-built website. (TNC)
- b) Convene resource managers, scientists and stakeholders to verify a common understanding of the ecosystems and the top-priority management challenges in each of them, and to identify research needs and information gaps that represent barriers to tackling the management challenges at a system scale. (WSU Extension Pacific County with assistance from TNC)
- c) Help address the needs identified in (b) by matching them with appropriate potential funding sources, sharing the information with other participants and promoting collaborative project proposals. (TNC with assistance from WSU Extension Pacific County and other stakeholders)

GOAL 4: IMPROVE THE PERMITTING PROCESS TO MAINTAIN AND GROW SUSTAINABLE AQUACULTURE.

4.1 Programmatic biological assessment for federal permitting of shellfish activities (NOAA)

The U.S. Army Corps of Engineers (Corps), in consultation with the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS), will develop a programmatic biological assessment (PBA) for Section 7 ESA consultation for common activities permitted by the Corps associated with shellfish, planting, harvest and restoration. Use of the PBA will increase the Section 7 consultation efficiency for applicants who meet the PBA terms and conditions.

Target dates:

- *Corps initiation of consultation: fall 2015*
- *NMFS and USFWS completion of consultation: spring 2016*
- *Corps implementation: Immediately upon completion of Section 7 consultation*
- *Report of permits issued with PBA: annually 2016–18*

4.2 Shellfish Interagency Permit Team Phase II (NOAA, ECY)

- a) Upon completion of federal PBA evaluate federal/state permitting

Target dates:

- *Investigate potential of programmatic permitting: April 2016*
- *Evaluation of 2017 Nationwide Permit 48: April 2016*

- b) Report to Governor on Shellfish Interagency Permit Team Phase I activities, including results and recommendations to increase efficiency of the permit process.

Target dates:

- *Draft report: February 2016*
- *Final report: March 2016*
- *Develop steps to implement recommendations: August 2016*

- c) Continue quarterly meetings of full Shellfish Interagency Permit Team to maintain broad engagement with tribal, local, state and federal agencies.

- *Develop a communication and outreach plan: July 2016*

- Evaluation of effectiveness: ongoing
 - Permit timelines to evaluate current and potential requirements for permit timelines: December 2016
- d) Convene Shellfish Interagency Permit Team working groups to achieve multi-agency review of new farm permit applications.

Target dates:

- *Ad-hoc response to requests for new farm permit assistance: ongoing*
- *Develop a work plan for improved implementation: August 2016*

4.3 Improve guidance for local shoreline master programs for shellfish aquaculture. (ECY)

Develop Permit Writers Handbook. Guidance for local government and Ecology permit writers on applicable laws and rules, limits and conditions, BMPs, cumulative impacts, no net loss, and the latest information and science useful for administering shellfish shoreline permits. SIP would serve as a technical review panel. Ecology (funding dependent)

Target Dates: by fall 2016

- *Complete draft outline and timeline*
- *Complete draft RFP and scope of work for handbook development*
- *Secure funding*

4.4 Increased involvement of Department of Agriculture in shellfish farming and interagency coordination. (WSDA)

- a) Continue engagement with industry through policy team shellfish lead.
- b) Schedule reoccurring meetings with WSDA, industry, tribal governments and partner agencies to share information, keep lines of communication open and identify opportunities for coordination.
- c) Continue agency and industry discussions on aquaculture coordinator role and ombudsman role at WSDA.

GOAL 5: RESTORE NATIVE SHELLFISH – OLYMPIA OYSTERS AND PINTO ABALONE.

5.1 Olympia oysters:

- a) Continue collaborative work to reestablish sustainable breeding populations in the state's 19 priority areas located in Puget Sound. *Note: Breeding populations have already been restored in two (Liberty Bay, Fidalgo Bay) of the 19 priority areas. On-the-ground work is underway in many of the remaining 17 areas. (WDFW, tribal governments, Puget Sound Restoration Fund [PSRF])*
- b) Collaboratively maintain and operate the Kenneth K. Chew Center for Shellfish Research and Restoration at the Northwest Fisheries Science Center's Manchester Lab and assist with optimization techniques for native Olympia oyster and pinto abalone production in support of state shellfish restoration goals. (NOAA, PSRF)

Target date: ongoing through September 2016

- c) Produce 2,500 bags of Olympia oyster seed (seeded cultch) to accelerate Olympia oyster recovery at priority sites. Genetically diverse seed will be produced at the Kenneth K. Chew Shellfish Center using conservation protocols co-developed by PSRF, University of Washington and Washington Department of Fish & Wildlife. (PSRF)

- d) Conduct water quality monitoring associated with shellfish production at the Kenneth K. Chew Center. Measurements of dissolved oxygen, salinity, temperature, pH and pCO₂ in hatchery water supply will be available daily to researchers at the center and annual seasonal data summaries available online. (NOAA)

Target dates: annual data summaries: September 2016

- e) Complete the Ecology-funded, 10-acre native oyster enhancement project in Port Gamble Bay. (PSRF)
- f) Seek funding to initiate an additional 10 acres of enhancement in two or three of the 19 priority locations to help reestablish breeding populations. (PSRF)
- g) Advance partnerships to accelerate and expand native shellfish restoration through funds from NRCS' Environmental Quality Incentives Program, which provides payments to farmers for habitat restoration. Identify opportunities and establish processes to provide payments to tribal governments and shellfish growers for restoration of Olympia oyster habitat. (NRCS)
- h) Evaluate native oyster restoration opportunities in Willapa Bay and Grays Harbor. (WSU Extension Pacific County)
 - Conduct a planning phase to evaluate feasibility of restoration work in coastal estuaries, based on current available science, to determine whether more research and evaluation are needed.
 - Complete survey of subtidal environments to conduct a more accurate assessment of current population size.

5.2 Pinto abalone (WDFW, PSRF)

- a) Optimize hatchery efforts to more efficiently produce juvenile and larval abalone (with funding from WDFW, DNR and NOAA).
- b) Outplant 5,000 juvenile abalone (2,500 in 2015; 2,500 in 2016).
- c) Outplant 2 million larval abalone.
- d) Complete the DNR-funded project to assess previous larval out plants and refine larval out plant methodologies.

5.3 Other native shellfish

- a) Take conservation actions if other native shellfish stocks are determined to be in decline or threatened. Actions may include restoration, stock status research and fishery closures.

GOAL 6: ENHANCE RECREATIONAL SHELLFISH HARVEST.

6.1 Enhance recreational shellfish harvest. (WDFW, DOH) *Note: This section also interconnects with Goal 1 on improving water quality as a key mechanism for increasing access to recreational shellfish harvest.*

- a) Maintain levels of seeding on recreational beaches by WDFW. Incremental funding increases will be needed to maintain a base level of seed planting.
 - Document increases in harvest trips and state funding resources.
 - Identify and pursue other avenues for funding.
- b) Identify opportunities for enhancement at key coastal recreational beaches. (WDFW)
- c) Increase recreational shellfish harvest at two large and strategically placed public tidelands. (WDFW, DOH)

GOAL 7: EDUCATE THE NEXT GENERATION ABOUT SHELLFISH RESOURCES, ECOSYSTEMS SERVICES AND WATER QUALITY. ENGAGE THE PUBLIC IN SHELLFISH RESOURCES THROUGH EDUCATION AND OUTREACH.

Preserving and understanding local shellfish resources, the role they play in the ecosystem, what they contribute to local economies, the history and culture of shellfish in Washington, the human actions that affect their health, the actions that are needed to protect shellfish resources and, finally, the consequences for both humans and the ecosystem if shellfish populations decline.

7.1 Formal education goals:

- a) Develop high-quality tools, curricula and materials that 1) teach K-12 students about shellfish resources in both classroom and field settings; 2) help schools meet Common Core and Next Generation Science Standards (NGSS); and 3) provide district support and train teachers to enable them to independently use the materials. (Pacific Education Institute [PEI])
- b) Integrate shellfish education topics (which include ocean acidification) in multiple subject areas as they provide a real-world case study. (PEI)
- c) Develop professional learning opportunities that help teachers connect shellfish resources to NGSS. (PEI)
- d) Recommend sample shellfish curriculum resources for educators on the [OSPI Environmental and Sustainability Education](#) standards website. (OSPI)
- e) Partner with tribal governments, state agencies and nonprofit organizations to provide internship opportunities for college students. (WSG)
- f) Translate shellfish and ocean acidification scientific research findings into fact sheets and other accessible information to share on a credible website (WSG) for access by K-12 students and educators. (WSG)

7.2 Informal education and outreach goals:

- a) Foster broad public understanding of local shellfish resources and the role they play in local ecosystems and economies. Topics include the history and culture of shellfish throughout Washington, human activities that impact shellfish resources and the consequences, for both humans and the ecosystem, if shellfish populations decline. Conduct activities and host events such as Whatcom Water Days, Kitsap Water Festival, Celebrate Oakland Bay, RainFest on the outer coast, State Park Shellfests, Oysterfest, Vashon-Maury Island Low Tide Festival and the Wooden Boat Festival (Olympia). (WSG)
- b) Foster citizen engagement and understanding of the role of shellfish in the coastal ecosystem.
 - Provide opportunities for citizen science monitoring, technical assistance programs, workshops and activities, including the State of the Oyster Study, technical assistance to tideland owners, marine biotoxin monitoring, and septic system education classes and socials.
 - Provide education and outreach tailored to coastal communities and visitors, including Willapa Bay Oysters documentary series curricula and outreach activities. (WSG)
 - Continue Shellfest and other educational/interpretive opportunities about shellfish and water quality, in Puget Sound, Georgia Straits, Grays Harbor, Willapa Bay and the outer coast. (WDFW, Parks, WSG)
 - Develop interpretive signage at public access sites with shellfish resources on the coast and at Puget Sound locations. (Parks)

- Promote shellfish safety through Web communication and posting public beaches that are closed to shellfish harvest due to marine biotoxins, pathogens and pollution. (DOH)
 - Host the Washington Shellfish Trail. (WSG)
 - Develop education materials and outreach to grocery stores, farmers markets and seafood restaurants about safe shellfish handling. (WSG)
- c) Host a gathering of informal shellfish educators to share resources and information. (WSG)

Key of state agency abbreviations:

- DNR – Department of Natural Resources
- DOH – Department of Health
- ECY – Department of Ecology
- Parks – State Parks
- WSCC – State Conservation Commission
- WSDA – Department of Agriculture
- WDFW – Department of Fish and Wildlife