

Shellfish Health and Harvest

C9. Abundant, healthy shellfish for ecosystem health and for commercial, subsistence, and recreational harvest consistent with ecosystem protection.

Shellfish play a significant role in the biological, cultural and historical context of Puget Sound. Healthy shellfish beds are essential to Puget Sound's ecosystem diversity and complexity.

Pacific Northwest tribes have lived and harvested shellfish in Puget Sound for about 12,000 years, and archeologists have uncovered shell middens dating back as far as 5,000 years. Shellfish provide sustenance and figure prominently in tribal spiritual beliefs. In the 1850s tribal governments signed treaties with the US government relinquishing land but reserving rights to fish and harvest shellfish in usual and accustomed areas except for staked or cultivated shellfish beds. Commercial shellfish harvesting began during the California Gold Rush era and continues today providing a significant source of jobs and economic activity in Puget Sound. In both Mason and Pacific counties, the commercial shellfish industry is the second largest private-sector employer, supporting more than 1,200 jobs and an estimated total annual payroll that exceeds \$27 million. Washington is the leading producer of farmed bivalve shellfish in the United States, generating an estimated \$77 million in sales and accounting for 86 percent of the West Coast's production in 2000.

In addition to the cultural, recreational, and economic contributions shellfish make in Puget Sound, they also can play a role in improving the water quality of the Sound. Shellfish filtering can improve water clarity so sunlight can get through, which can improve eelgrass and macroalgae growth. Shellfish assimilate some of what they take in and pass on the rest as digested and undigested material that settles to the bottom sediments. These filtering and recycling processes can contribute to regulating the health of nearshore ecosystems and take on more importance as human activities and related pollution increase in shoreline areas. They also provide structure to the nearshore and refuge and forage opportunities and can help remove nitrogen from the water.

Expanding and promoting financial incentives and programs that protect, reopen, and enhance shellfish harvest areas and that restore and enhance the native Olympia Oyster and Pinto Abalone will contribute to Puget Sound recovery. Strategies in this area focus on supporting working aquatic lands and on improving water quality to protect and restore shellfish beds for human consumption. Additional strategies and actions that will contribute to the health and recovery of shellfish harvesting areas also are addressed in Sections on wastewater, stormwater, and toxics.

Relationship to Recovery Targets

Reopening shellfish beds and avoiding closures are addressed directly with a specific recovery target of a net increase of 10,800 harvestable shellfish acres from 2007 to 2020, including at least 7,000 acres where harvest is currently prohibited. In addition, progress towards the recovery targets for management of on-site sewage systems and freshwater quality will improve conditions for shellfish.

C9.1 Improve water quality to prevent downgrade and achieve upgrades of important current tribal, commercial and recreational shellfish harvesting areas.

Protection and improvement of water quality and control of pollution will be critical to meeting the recovery target for shellfish harvesting areas for Puget Sound.

The Department of Health monitors shellfish harvesting areas and classifies them as safe or unsafe for harvest. As of the end of 2010, the Department of Health managed the classification of 326,000 commercial shellfish harvesting acres, approximately 190,000 in Puget Sound. There were 257,000 acres with Approved classifications, 6,900 acres with Conditionally Approved classifications, 300 acres with restricted classifications, and 61,000 acres with Prohibited classifications.

In 2010, Health upgraded the classification of 3066 acres in 10 commercial shellfish areas. Over the same time, 33 acres were downgraded in one area. Over the past 29 years, Health has downgraded the classification of about 51,000 acres and upgraded the classification of about 42,000 acres. Most of the downgrades took place between 1981 and 1995, when 45,000 acres were downgraded and 7,000 acres were upgraded. Since 1995, Health has downgraded only 6,000 acres while upgrading 38,000 acres. In Puget Sound, approximately 36,000 acres – or about 19% of commercial and recreational shellfish beds – are closed due to pollution sources. The Department of Health also lists shellfish beds that are threatened with downgrade each year. In 2010 seven areas were listed as threatened with downgrades in classification in Puget Sound: Mystery Bay, Port Townsend, Burley Lagoon, Dyes Inlet, Samish Bay, South Skagit Bay, and Drayton Harbor.

In recent years, through efforts of state and local government, Tribes, private landowners, and shellfish growers, we have seen a net increase in the number of acres of shellfish areas open for harvest due to pollution control. Strategies and actions in this area are focused on capitalizing on the lessons learned from these experiences and increasing this trend.

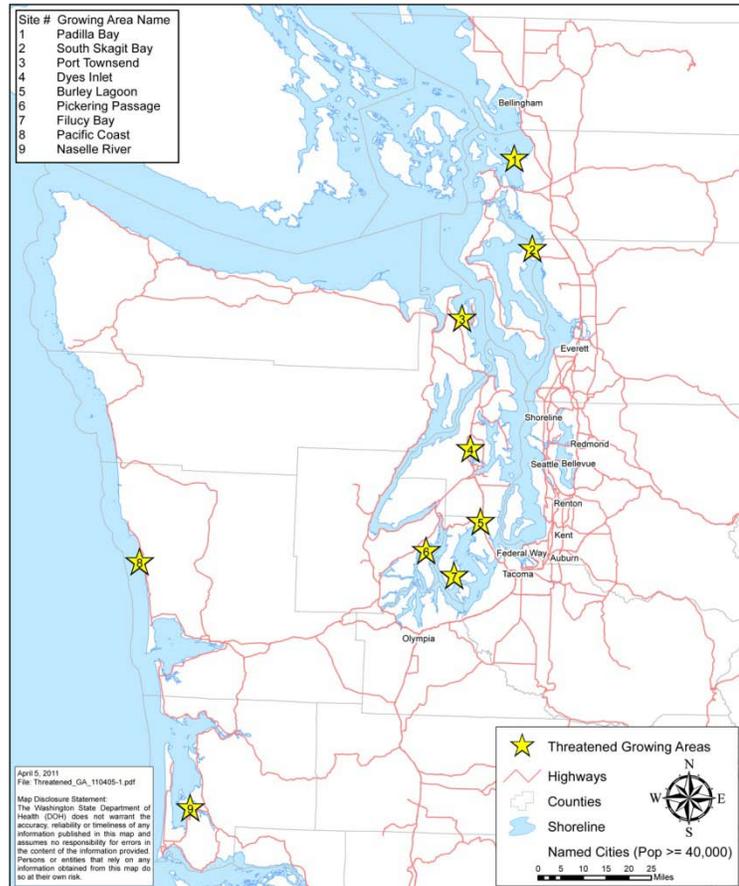
Ongoing Programs

The Department of Health is responsible for evaluating shellfish harvest areas to ensure they are safe. DOH, WDFW, Tribes and local health departments work together to take actions to prevent shellfish harvest when water quality conditions indicate that shellfish are unsafe to consume. Based on water quality and pollution source evaluations, DOH identifies specific locations where shellfish harvesting is "threatened" or "of concern" due to pollution. Unless pollution problems are addressed, "Threatened" areas still meet the standard for their current classification, but could soon be downgraded in classification because water quality is close to failing the standard, or because existing pollution sources may impact public health. Areas "of concern" are those where water quality is declining. These areas deserve special attention to prevent a downgrade.

Local governments play a significant role in protecting and restoring water quality in shellfish harvest areas. Pollution Identification and Correction Programs (PIC programs) are locally driven processes to determine the causes and sources of nonpoint -water pollution in specific geographic areas. PIC

programs focus on a complete survey of all individual properties to identify non-point pollution sources and use outreach, education, incentives and technical assistance to encourage pollution reduction and control. They are widely believed to be one of the single best approaches to protecting and reopening shellfish beds, including Henderson Inlet in Thurston County and several areas of Kitsap County. These programs are resource intensive, both for the initial survey and outreach work and to maintain the level of education and commitment to pollution control over time; but they produce positive results. Current funding for PIC programs comes from local sources and state and federal grants. In 2011/2012 over \$2 million in EPA funds will be distributed to counties and tribes to develop sustainable PIC programs; however, stable long-term funding and support for local governments also are needed so these programs can continue to protect and reopen shellfish harvest areas.

2011 Threatened Shellfish Growing Areas



Counties are required to form shellfish protection districts where areas are downgraded, but counties can also create voluntary shellfish protection districts. A district provides a mechanism to generate local funds for water quality services to control sources of pollution. They also can serve as educational tools, calling attention to the pollution sources that threaten shellfish harvest areas. Shellfish protection districts can be used in concert with (or to create funding for) PIC programs; however funding for district planning and start-up is needed.

Near-Term Actions

C9.1 NTA 1: Replicate model programs, such as those in Henderson Inlet and Oakland Bay, which create coordinated, locally-driven efforts to protect and improve shellfish harvest areas. Create a best practices library or menu highlighting successful strategies so that jurisdictions do not have to reinvent the wheel.

Performance measures: Best practices library complete or not; number of replicate efforts/programs

- C9.1 NTA: 2** [Who] will convene a forum of stakeholders and regulatory agencies involved in the restoration of water quality in shellfish growing areas to:
- › Assess how state and federal agencies can enhance local governments' efforts to respond to threatened and downgraded shellfish areas.
 - › Develop an agreement between state agencies regarding roles and responsibilities.
 - › Identify methods and tools that help identify and correct nonpoint pollution problems.
 - › Provide incentives for local governments for the long-term protection of shellfish growing areas.

Performance measure: Done or not

In addition, strategies and actions related to development of Pollution Identification and Correction (PIC) programs described in C11.4 are directly related to recovery of shellfish beds.

C9.2 Restore and enhance native shellfish populations.

Ongoing Programs

Key Ongoing Program Activities

- The Washington Department of Fish and Wildlife, in collaboration with partners such as The Puget Sound Restoration Fund and The Nature Conservancy, and in collaboration with individual tideland owners, Tribes, Marine Resource Committees of the NWSC, WDFW and other state and local partners, will implement the Native Oyster Rebuilding Plan including accelerating restoration of the Olympia oyster. This will restore 19 historic large natural oyster beds throughout Puget Sound by 2020.
- WDFW, PSRF, university researchers, and NGOs will use a 3-year NOAA grant to improve wild stock abalone hatchery methods and increase production of genetically diverse and disease free juveniles for out-planting. They also will seek additional funding to staff and expand abalone hatchery capacities and to develop remote nurseries and abalone food resources, thereby improving the opportunity to build local stocks to naturally reproducing levels.

Near-Term Actions

None; work in the near-term will focus on implementation of ongoing programs.

C9.3 Encourage environmentally responsible shellfish aquaculture and enhancement of the recreational harvest based on sound science.

Ongoing Programs

Key Ongoing Program Activity

- SeaGrant will complete the Geoduck Aquaculture Research Program and provide ongoing forums to share results and final reports of the three funded studies by December 2013.

Near-Term Actions

C9.3 NTA 1: [DNR] will work with stakeholders to create pilot projects testing the use of mussel culture or other suspended or beach culture to mitigate nitrogen pollution in sensitive areas, such as the project in Quartermaster Harbor. This aquaculture application may serve to encourage public-private opportunities to reduce nitrogen impacts that are both efficient and cost effective and provide an alternative to advanced wastewater treatment technology.

Performance measure: Number of replicate projects

C9.3 NTA 2: Ecology will revise the Shoreline Master program Guidelines or create targeted guidance handbook on aquaculture for local governments based on Sea Grant research and other vetted sound science suitable for application in Puget Sound.

Performance measure: Done or not

C9.4 Resolve competing priorities between aquaculture and nearshore, habitat and upland uses.

Intensive shellfish aquaculture can put pressure on Puget Sound and there are concerns that these activities may increase pollution, change the physical beach structure and substrate to the detriment of native species abundance and diversity, disrupt the food web, and affect other resource-based jobs such as fishing or crabbing. In particular, the effects of geoduck aquaculture on the benthic environment and fauna, food webs, water quality, and aesthetics are a concern. In 2007 the Washington Legislature directed Washington SeaGrant through HB 2220 to review existing scientific information and commission scientific research to examine key uncertainties related to geoduck aquaculture that have implications for the health of the Puget Sound ecosystem and the wild geoduck population. Ongoing studies include investigations of: the ecological and geochemical consequences of disturbances associated with geoduck aquaculture; cultured-wide interactions; and resilience of soft-sediment communities after geoduck harvest in Samish Bay. In 2007, HB 2220 also directed Department of Ecology to convene a Shellfish Aquaculture Regulatory Committee (SARC) to provide direction to Sea Grant regarding the scope of research. The SARC continues to annually meet to advise Sea Grant on the scope of research.

Continuing work is needed to clarify the impacts of intensive shellfish aquaculture and to help communities build consensus and collaboration on the role of shellfish aquaculture in Puget Sound.

Ongoing Programs

HB 2220 also provided for the SARC to advise Department of Ecology on revisions to Chapter 173-26, Part III WAC (Shoreline Master Program Guidelines) regarding geoduck aquaculture. Effective March 2011, the Department of Ecology published provisions requiring that updates to local Shoreline Master Programs include an inventory of information such as water quality data; known sediment contamination; existing shellfish cultivation areas and shellfish protection districts; and other data to inform the siting of aquaculture. These provisions also addressed geoduck aquaculture activities by requiring conditional use permits for new commercial geoduck aquaculture; setting forth application requirements for proposed geoduck operations; providing guidance for permit content and administration; and ensuring notification of proposed geoduck aquaculture projects to nearby landowners and tribes with usual and accustomed fishing rights to the area.

The provisions were developed with extensive input from property owners, tribes, shellfish growers and interested members of the public, with a view towards taking steps to resolve potential conflicts between aquaculture and upland uses.

In addition, in March 2010, the Washington State Legislature passed and the governor enacted a law on marine spatial planning in Puget Sound and along the Washington Coast requiring an interagency assessment and report on information related to marine spatial planning and recommendations. This report was completed in January 2011 and contains 21 recommendations related to implementing marine spatial planning in Washington, including Puget Sound. Implementation of marine spatial planning will give shellfish growers and upland owners greater certainty about where aquaculture will be permitted and further reduce the likelihood of conflicts related to aquaculture.

Finally, as described above, the Washington SeaGrant Geoduck Aquaculture Research Program is continuing.

Key Ongoing Program Activity

- Ecology will review any new aquaculture proposals for consistency with the Coastal Zone Management Act.

Near-Term Actions

C9.4 NTA 1: [Who] will support pre-planning and implementation of marine spatial planning and local shoreline master program updates by: gathering, compiling an ground-truthing baseline information on current aquaculture and filling data gaps and completing research to identify areas that are suitable and unsuitable for future shellfish aquaculture.

Performance measure: To be determined

C9.5 Implement Washington State’s Shellfish Initiative.

On June 9, 2011, NOAA announced the release of final national aquaculture policies issued by the Department of Commerce and NOAA. These policies establish a framework to allow sustainable domestic aquaculture to contribute to the U.S. seafood supply, support coastal communities and important commercial and recreational fisheries, and help to restore species and habitat. NOAA sees aquaculture as a critical component to meeting increasing global demand for seafood and maintaining healthy ecosystems. Washington State has developed a Shellfish Initiative in coordination with NOAA’s National initiative.

Priorities in the Washington State Initiative include: [PLACEHOLDER]

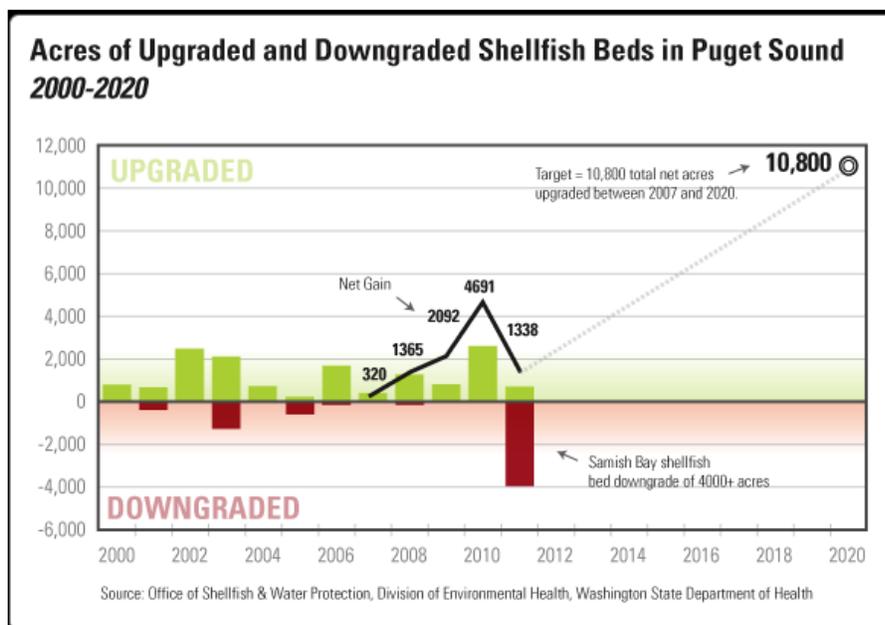
Near-Term Actions

C9.5 NTA 1 [PLACEHOLDER: Discussions are ongoing about implementation of these policies/initiatives relative to Puget Sound shellfish and near term actions will be added as they are identified. Some issues that may be addressed are: creating a communication plan for shellfish; promoting native shellfish restoration and recreational shellfish harvest; ensuring clean water to protect and enhance shellfish beds.]

Target View: Restoring Shellfish Beds in Puget Sound

Around Puget Sound, there are an estimated 190,000 acres of classified commercial and recreational shellfish beds. According to the State Department of Health, about 36,000 acres – approximately 19 percent – are closed due to pollution. The pollution is from a variety of sources, but mostly from fecal bacteria from humans, livestock and pets that gets into the water and threatens the areas where oysters, clams and other bivalve shellfish grow.

The 2020 recovery target for shellfish beds is a net increase of 10,800 acres of harvestable shellfish beds, of which 7,000 acres must be from beds presently classified as prohibited. The graph below illustrates recent data on the status of shellfish beds in Puget Sound, and relationship to the proposed target.



Green and red bars represent the annual upgraded and downgraded acres, respectively, while black line represents the net increase in harvestable acres of commercial and recreational shellfish beds in Puget Sound toward the 2020 goal of 10,800. Net increase is the upgraded acres in existing shellfish growing areas (or the restoration of unclassified acreage) to allow harvest, minus any downgrades in classification that prevent harvest. Downgrades of the shellfish beds are generally caused by fecal bacteria or other pollutants in the water that makes the shellfish unsafe to eat.

The three Action Agenda strategies most related to achieving the shellfish bed recovery target are:

- Improve water quality to prevent downgrade and achieve upgrades of important current tribal, commercial and recreational shellfish harvesting areas (C9.1)
- Improve and expand funding for on-site system maintenance, repair and replacement (C5.3)
- Develop and implement local and tribal pollution identification and correction (PIC) programs (C11.4)

In the following results chain, or logic model, yellow polygons identify strategies and actions from the Action Agenda that we believe will contribute significantly towards meeting the target. Arrows to the

blue boxes describe the intermediate results the strategies and actions are expected to achieve. The purple boxes show the reduced pressure on the ecosystem that is expected to occur, the green ovals show the areas of the ecosystem where the change will be observed, and the dark green square shows the recovery targets.

