Shellfish Beds

At low tide, the waters of Puget Sound reveal an amazing abundance of oysters, clams, mussels, and more—a bounty unparalleled elsewhere. Gathering shellfish is a time-honored tradition for the public, and today it is an industry that supports thousands of jobs and brings millions of dollars into the region.

Around Puget Sound, there are an estimated 190,000 acres of classified commercial and recreational shellfish beds. However, about 36,000 acres of shellfish beds—approximately 19%—are closed due to pollution, most of which comes from fecal bacteria from humans, livestock, and pets. When fecal bacteria and other contaminants get into the water, they threaten the areas where these prized oysters, clams, and other bivalve shellfish grow.

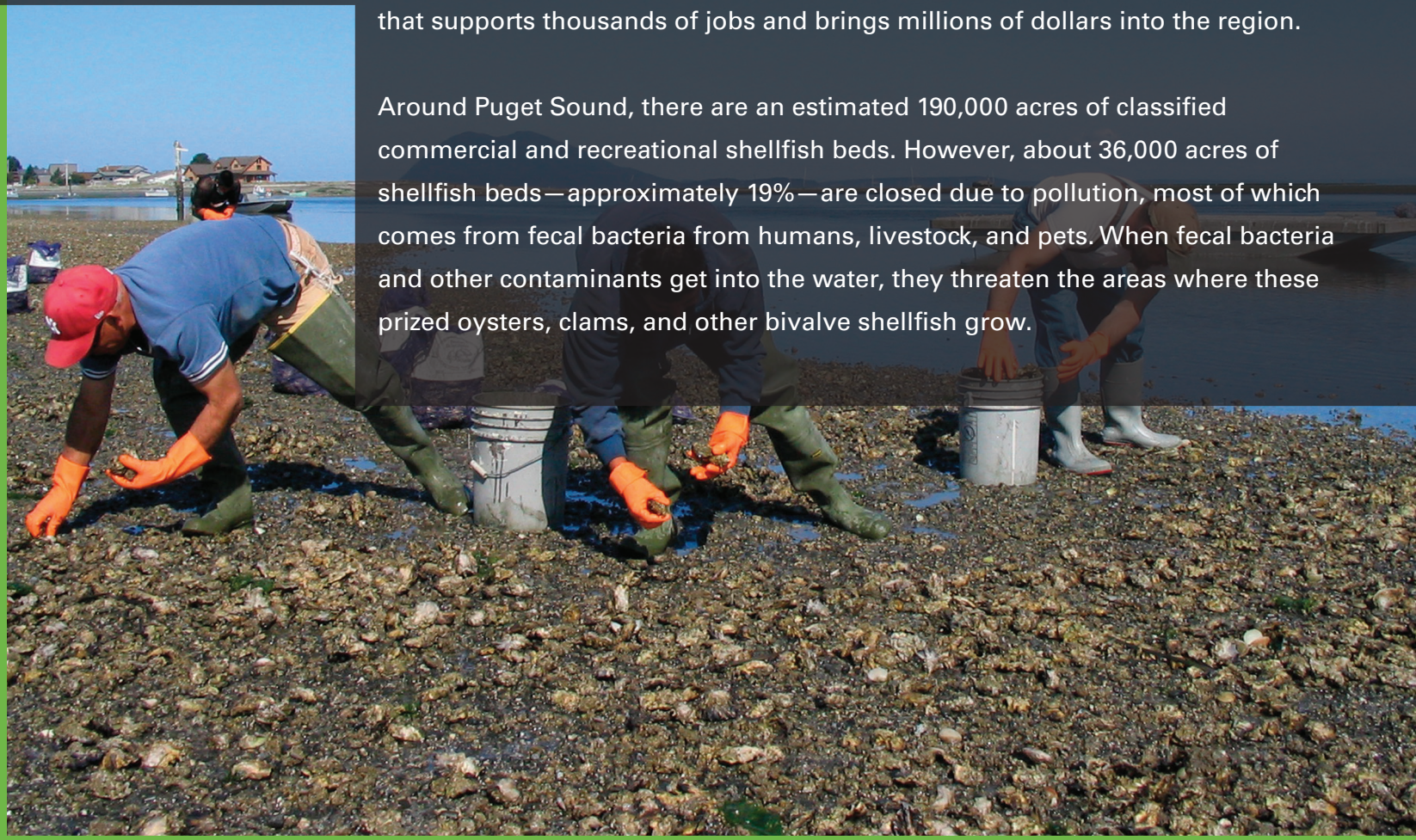


Photo Credit: Taylor Shellfish

Shellfish Beds

INDICATOR:

Acres of harvestable shellfish beds

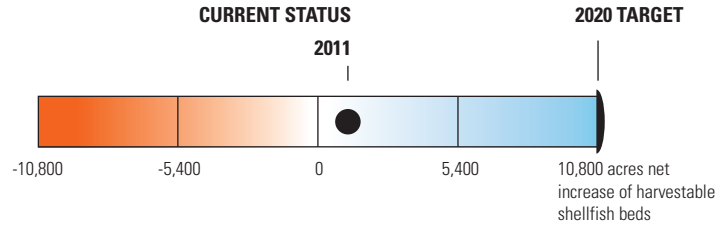
Indicator lead: Scott Berbells, Washington State Department of Health

TARGET:

A net increase of 10,800 harvestable shellfish acres, including 7,000 acres where harvest had been prohibited, between 2007 to 2020.

PROGRESS:

IS THE TARGET MET?	NO	IS THERE PROGRESS?	YES



Since 2007, some shellfish harvest areas were upgraded while others were downgraded. The net result was an increase of 1,384 acres of shellfish beds open for harvest.

Progress Towards 2020 Target

The 2020 target has not been reached yet, but there has been some progress. Shellfish beds are considered harvestable when their status is upgraded. Between 2007 and 2011, more acres of shellfish beds were upgraded than downgraded across all classifications, resulting in a net increase of 1,384 acres of harvestable shellfish beds. A net 3,290 acres of shellfish beds were upgraded from the prohibited classification (3,437 acres upgraded minus 147 acres downgraded to prohibited).

However, these upgrades in growing area classifications from 2007 through 2011 were dramatically offset by the recent downgrade of the Samish Bay shellfish growing area (4,037 acres), impacting the overall net acreage gained since 2007 and slowing progress toward the 2020 goal.

What Is this Indicator?

The shellfish harvest area classification process is defined in federal rules and adopted in state regulations. The Department of Health (DOH) implements the rules at the state level. The purpose of the DOH program is to assure that harvested shellfish are safe to consume. This also includes making certain that pollution sources are continually assessed and marine water quality monitored around every classified harvest area. The data collected for the classification process not only represent the conditions that dictate shellfish harvest, but their trends can also indicate a healthier Puget Sound.

Classification of Shellfish Areas in Puget Sound.

Classification	Definition	Acreage in 2011
Approved: commercial harvest for direct marketing allowed	Sanitary survey shows the area is not subject to contamination that presents an actual or potential public health hazard.	141,081
Conditionally Approved: opened or closed for predictable periods of time	Meets Approved criteria some of the time, but not during predictable periods. The length of closure is based on data that show the amount of time it takes for water quality to recover before the area can be reopened.	11,384
Restricted: cannot be marketed directly and must be transplanted to Approved growing areas for a specified amount of time	Meets standards for Approved criteria, but the sanitary survey indicates a limited degree of pollution from non-human sources. Harvest must be transplanted to Approved growing areas to allow shellfish to naturally cleanse themselves of contaminants before they can be marketed.	307
Prohibited: closed to commercial and recreational harvest	When the sanitary survey indicates that harmful substances may be present in concentrations that pose a health risk. Growing areas that have not undergone a sanitary survey are also classified as Prohibited.	35,683

Table 1. Classification of shellfish areas in Puget Sound and number of acres in each class in 2011.

DOH classifies 91 different shellfish growing areas in Puget Sound, covering roughly 190,000 acres. Sites are classified as "approved," "conditionally approved," "restricted," or "prohibited" (Table 1). Upgrades in classification mean that water quality has improved, allowing for fewer restrictions on shellfish harvest. Downgrades mean there are either more restrictions on when shellfish may be harvested or no harvest is allowed at any time. Downgrades are generally caused by fecal bacteria or other pollutants in the water that make the shellfish unsafe to eat. The "acres of harvestable shellfish beds" indicator refers to those shellfish harvest areas that have been upgraded.

DOH samples over 1,200 marine water stations between six and 12 times each year for fecal coliform bacteria, salinity, and temperature. Between 2.5 to five years of bacteria sampling data are used in the classification of each marine water station. In addition, shoreline pollution sources, including wastewater treatment plants, individual on-site sewage systems, marinas, farms, and any other activity with the potential to impact the shellfish area, are evaluated periodically and results are integrated in the classification process.

Shellfish Beds

Interpretation of Data

Status and Trend

Of the total harvest area classified in 2011, 152,465 acres or 81% was approved or conditionally approved for harvest (Table 1). Thus, shellfish harvest is possible in most of the areas under DOH jurisdiction, and these areas are distributed across all sub-basins of Puget Sound (Figure 1).

In contrast, over 35,000 acres (19%) of shellfish harvest areas were classified as prohibited due to the proximity of pollution sources or poor water quality (Table 1). Over 60% of this acreage is prohibited because of a nearby wastewater treatment plant outfall, 29% because of nonpoint pollution sources, 8% because of marinas, and 2% because of other factors that could impact public health.

From 2007 through 2011 improved sanitary conditions resulted in net upgrades in classifications totaling 1,384 acres (Figure 1). A classification downgrade in April 2011 within the Samish Bay shellfish growing area (4,037 acres) dramatically impacted the net acreage gained since 2007.

The DOH predicted that 8,738 acres could potentially be upgraded between 2012 and 2020. This analysis incorporates information about the known or suspected

Acres of Upgraded and Downgraded Shellfish Beds in Puget Sound
2000–2011

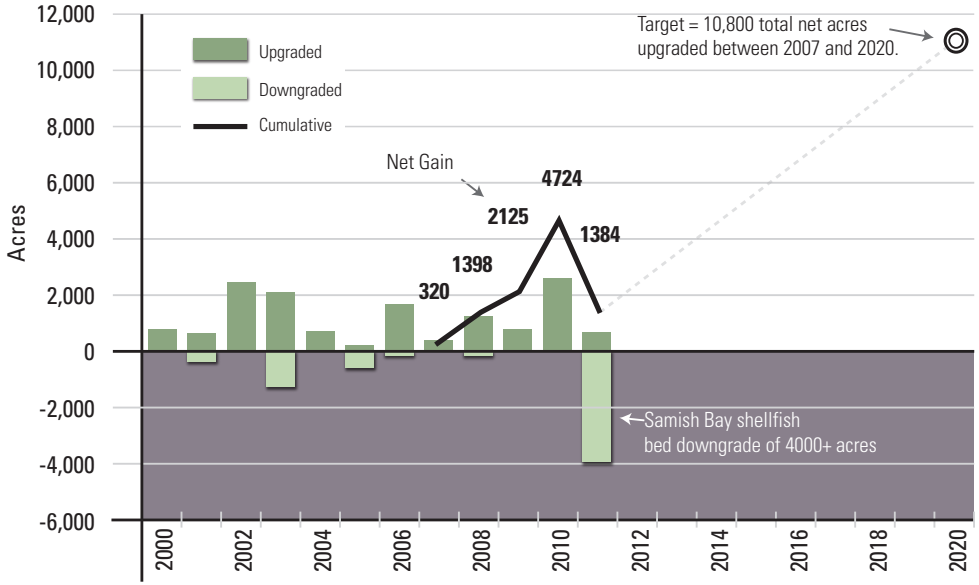


Figure 1. Number of acres in Puget Sound by annual harvest area classification changes from 2000 through 2011. Also shown is the cumulative net improvement from 2007 and 2011. The large green downgrade in 2011 relates to Samish Bay.

Source: *Source: Washington Department of Health, Office of Shellfish and Water Protection*

causes of harvest restrictions and an area-by-area evaluation of the current activities and water quality trends. These projections, coupled with the current 2007 through 2011 net acreage increase of 1,384 acres, results in a predicted increase of 10,122 acres by 2020, just short of the 10,800 acres target value. However, downgrades are almost certain to occur during the same timeframe, thereby counteracting the upgrades and further widening the gap to the target value.

Although the Sound-wide trend in improvement is positive, many factors affect the long-term ability to reach the target. Intensive efforts to restore growing areas, such as in the Samish harvest area, are counter-balanced by shoreline development and polluted runoff from stormwater, on-site septic systems, and farms near existing open areas. Unless there are aggressive actions to improve wastewater treatment plant outfall locations, on-site septic system operation and maintenance, and agricultural best management practices, the 2020 target will likely not be met.

Figure 2. Distribution of classified shellfish harvest areas in Puget Sound as of the end of 2011.
Source: Washington Department of Health, Office of Shellfish and Water Protection

Skagit Stream Team and Storm Team

Stream Team

Sponsored by the Skagit Conservation District in partnership with the Padilla Bay National Estuarine Research Reserve, the cities of Mount Vernon, Anacortes, Burlington, Sedro-Woolley, and Skagit County, the Skagit Stream Team began in 1998 with a mission to educate and involve local citizens in the protection and stewardship of local streams. Currently, 70 dedicated Stream Team volunteers regularly measure water quality in ten watersheds in Skagit County.

STORM Team

A high fecal coliform result during a heavy rain event in 2008 in the Samish watershed, an important commercial shellfish growing area, raised concerns and led to the creation of the Storm Team. Although Samish Bay usually has good water quality, tests showed that during storms large volumes of pollutants wash off the landscape into local streams and rivers and contaminate the bay.

The Storm Team is a dedicated core of volunteers that head out in the middle of rainstorms as streams and rivers are rising to collect water samples for fecal coliform bacteria testing. Testing during high flow conditions is an important complement to the Stream Team's regular ambient monitoring, and it has been instrumental in identifying priority areas for clean up efforts.

Initial Storm Team efforts in the Samish watershed helped establish baseline data for the river during storm events for the Washington State Department of Health (DOH) Office of Shellfish & Water Protection, which regulates the commercial shellfish industry. DOH uses fecal coliform loading to determine when to issue a pollution closure.

As a result of Storm Team and Skagit County sampling, DOH changed the classification of most of Samish Bay from Approved to Conditionally Approved in 2011. Samish Bay commercial shellfish growing areas are now closed automatically when the river reaches 4.7 trillion fecal coliform colonies per day—a level determined to pose a risk for shellfish consumption.

Storm Team sampling efforts were critical in documenting fecal coliform contamination problems in the Samish watershed. The Clean Samish Initiative (CSI), a partnership of local, state, and federal agencies and organizations, was launched in 2010 by Skagit County with funding from the US Environmental Protection Agency. The CSI effort was put together to identify sources of fecal contamination and to find ways to correct them. With increased County sampling efforts under the CSI, the Skagit Storm Team has been able to redirect efforts over the last two years to the Bay View and No Name Slough drainages in the Padilla Bay watershed.

More information about the Skagit Stream Team and Storm Team can be found at:
www.skagitcd.org/stream_team

Information about the Clean Samish Initiative can be found at:
www.skagitcounty.net/cleanwater

Samish River | Photo: Eutrophication&hypoxia @flickr

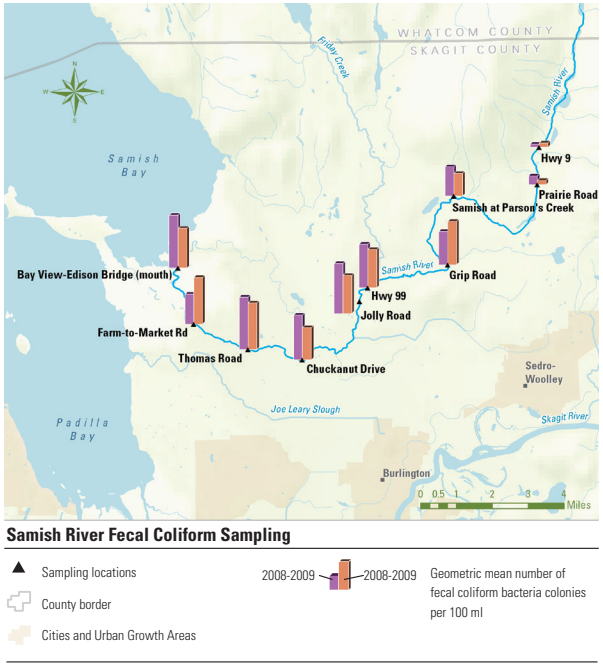


Figure 1. Fecal Coliform counts in Samish river