

## The Dogfish Bay Olympia Oyster Story

Dogfish Bay is an Olympia oyster stronghold, once again, after years of seeding and shell enhancements dating back to 2000 and involving over 25 collaborators.

As with all Olympia oyster rebuilding efforts, the story of Dogfish Bay begins with the right habitat conditions and a rich layering of human history. Dogfish Bay is a protected, semi-enclosed embayment with long water residence time and a broad, wet tide flat exposed at minus tides. Suquamish people gathered oysters here historically. Later, Washington State designated Dogfish Bay as an historic Olympia oyster reserve through the 1930s in order to protect the population as a seed source. For the next 50+ years, Coast Oyster Company cultivated Pacific oysters commercially in Dogfish Bay, before the tidelands were vacated in the 1990s and transferred back to the State.

Our part of the Olympia oyster story picks up in 1999, when PSRF and Washington Department of Fish & Wildlife (WDFW) first started working together on Olympia oyster restoration following the completion of WDFW's 1998 Olympia oyster stock rebuilding plan. At the time, Dogfish Bay was a muddy expanse with just a handful of remnant Olympia oysters attached to relic Pacific oyster shell in low wet spots on the tideflat. Though numbering just in the hundreds, this living oyster presence sparked early seeding efforts to re-establish a breeding population in Dogfish Bay. Modeled after seeding projects in Oregon conducted in the early 1990s, this initial foray into Olympia oyster seeding was guided by Bill Taylor, Joth Davis, Hal Beattie, and the Suquamish Tribe, all of whom generously shared knowledge and remembrances. A groundswell of other partners soon followed, including the U.S. Navy, private tideland owners, UW researchers, and many others.

### Early seeding

For our initial gambit, [we collected adult brood oysters from a Port Madison saltwater pool](#), located within the same sub-basin as Dogfish Bay. It was an auspicious start: an abundant source of local, Central Sound oysters combined with a wildly enthusiastic Port Madison home owner delighted at the prospect of boosting the population of his beloved Olympia oysters. The adult oysters we collected in the pool were used to produce seed for Dogfish Bay in 2000 at WDFW's Pt. Whitney hatchery (now operated by Jamestown S'Klallam Tribe).

In the years that followed, several other seeding efforts occurred, in 2002 with seed produced at the Taylor Shellfish hatchery (89,000 spat-on-shell), and in 2006 with natural set seed transferred from the nearby Keyport estuary (30 bags of spat-on-shell) and Stiles Lagoon (18 bags of spat-on-shell). A final additional seeding occurred in 2006 with seed produced at the Lummi hatchery using Central Sound broodstock (150 bags with 120,000 spat-on-shell). This latter seeding effort was done expressly to monitor ecosystem benefits associated with Olympia oyster beds. All told, these early seeding efforts in Dogfish Bay kick-started the local population into high gear.

### Transition to Shell enhancements

The next move, devised with WDFW and Joth Davis, involved a critical shift toward enhancing settlement structure at the site to enable larvae from the growing population to re-colonize historic native oyster ground. Thus followed a series of shell enhancements, conducted annually between 2007 and 2011, ultimately spanning close to 10 acres. To effectively create an emergent structure on an otherwise muddy expanse, we spread Pacific oyster shell to establish a base layer for developing a structured oyster bed that would eventually attract a dense assemblage of Olympia oysters. This replicated exactly the relic Pacific oyster shell that we had observed in 1999 set with a handful of Olympia oysters. In the years that followed, shell spreading has become one of PSRF's main strategies for enhancing native oyster beds throughout Puget Sound. The basic concept for this approach can be boiled down to: if you build it, they will come. That is, if you build a base layer of shell in the right place with the right conditions, Olympia oysters will follow.

As the work in Dogfish Bay increased in scale, so did the partnerships. NOAA's Community-based Restoration Program and The Nature Conservancy became core partners. Larger-scale projects encompassed tidelands managed by Washington Department of Natural Resources. Shell spreading required boats and cranes and barges, deftly managed by Hood Canal Oyster Company, and others. Fire hoses and pumps were borrowed from the Squaxin Island Tribe and cobbled together with other equipment. The community partners and funding to sustain this restoration enterprise grew to include National Fish & Wildlife Foundation, USDA, EPA, Fish America Foundation, Safeway Foundation, Kitsap County, Port of Poulsbo, Fred Hill Materials, local Rotary Clubs, and many others.

### Results

Today, Olympia oysters in Dogfish Bay number in the millions. In the early years of shell enhancement efforts, as we scaled our practices, our goal was to restore a density of 75 oysters/m<sup>2</sup>, to replicate oyster density in a large natural Olympia oyster bed in North Bay, which is located in South Puget Sound. A 2013 population survey conducted in Dogfish Bay following years of enhancements indicated oyster density at 85 oysters/m<sup>2</sup>, with 2.6 million oysters over 8 acres surveyed, filtering 47% of the estuary. A 2017 survey indicated oyster density at 163 oysters/m<sup>2</sup> with 6 million oysters over ~8 acres filtering 107% of the estuary (using a clearance rate calculated at 0.34 liters/hour (= 2 gallons/day). The 2013 and 2017 surveys were limited to the core project footprint. They did not take into account the expanding oyster population on surrounding tidelands where conditions are similarly suitable.

[Dogfish Bay is one of the bigger Olympia oyster success stories in Puget Sound.](#) It is a prime example of a pilot seeding effort, transitioning to larger-scale, iterative shell enhancements resulting in a self-sustaining Olympia oyster population in the millions. Olympia oysters are now the dominant species, providing significant

ecosystem services, in the form of both habitat structure and estuary filtration, in this small 50-acre semi-enclosed embayment.

This is also a tale of small beginnings leading to great things. For us, the Dogfish Bay story began with a fellow oyster enthusiast who happened to have a saltwater pool loaded with Olympia oysters. But the Sound-wide oyster rebuilding effort that has since grown has been sustained by hundreds of people who have gleefully jumped on board to rebuild a resource that is meaningful, personally and ecologically.

And we are nowhere near done. To bring the story full circle, in 2020, the Port Madison saltwater pool may be used again as a potential tool for rebuilding Olympia oysters on the Seattle waterfront for a project with Port of Seattle. Also in 2020, PSRF is gearing up to conduct a 2020 population assessment in Dogfish Bay, with high hopes that the population far exceeds the 6 million last estimated in 2017.