



## The Oregonian

### Cultivating oysters

**Between the ebb and flow of the tide, researchers and conservationists toil in the mud of Netarts Bay in hopes of restoring Olympia mollusks, native Northwest bivalves that fell victim to pollution and their own popularity a century ago**

Wednesday, August 02, 2006

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The Oregonian

Tidewaters rush out the S-shaped channel at the north end of Netarts Bay. In a matter of hours, 21/2 billion gallons of brackish water will have flowed through this narrow outlet; the waterline will drop four feet and expose the hidden ecosystem that these tidal oscillations have shaped over thousands of years.

For the past year, these ancient mud flats have had some new residents. Thousands of Olympia oysters have been prisoners in green mesh bags, drinking nothing but muck, algae and seawater -- 10 gallons or more a day. On this morning, between the ebb and the flow of the tide, researchers and conservationists will tear open these bags and sprinkle the "Olys" on two one-acre ecological plots. This Nature Conservancy project is one of many in Oregon and Washington that aim to restore the Northwest's only native oysters to their historic range.

Olympia oysters were overharvested more than 100 years ago: 130,000 bushels a year were shipped from Puget Sound to California gold miners in the 1890s, stacked atop fresh timber. Oysterville, Wash., was once printed on maps with a type larger than that for Seattle or Tacoma. In 20 years, shipments of the flavorful oysters dropped by almost 90 percent. The remaining oysters were drowning in wood pulp and other water pollution. They have never recovered.

It is just after 7:30 in the morning, and the team slips on waders at the end of Netarts dock. Dick Vander Schaaf takes a sip of coffee, and his white curls wrap around the edge of his Nature Conservancy baseball cap. The conservation director doesn't once mention that he's in a hurry, that the team is -- as always -- racing against the water. He's banking on the fact that the low tide is close to a foot below sea level today, meaning the flats will be exposed for longer than usual.

A few Olympia oysters still live here, says Mark Wittwer, a longtime oyster harvester volunteering both his boat and his time for the project. He doesn't think they ever existed in huge numbers even before they were overharvested. "Their color is a pearly green inside," Wittwer says with a sort of reverence. They are less than an inch-and-a-half wide and have an irregularly shaped, circular shell with a pattern of radiating ridges and concentric lines.

Wittwer is protective of the oysters, Vander Schaaf says. He comes out to check on the bags every week. During winter, when the project was still in limbo, Wittwer was one of the few volunteers who would head out at dusk with Vander Schaaf to clear the silt from the bags so that the captive oysters could continue to feed and breathe normally.

The Nature Conservancy had planned to release the Olys last year, but the Department of State Lands, which is responsible for leasing submerged lands in Netarts Bay, put a hold on the project. Kevin Moynahan, the department's assistant director for wetlands and waterways conservation, says that there was a question about the type of activities allowed in Oregon State University's shellfish reserve. After lengthy negotiations, the conservancy and OSU obtained a temporary use permit for their restoration work

in April. After all the paperwork, Vander Schaaf is pleased to be back in the field.

### **An ideal habitat**

The two motorboats glide south in the coastal channel, the mud flats stretching out to their right. Clouds slink over the foothills and spill into the mouth of the bay where the waters swirl past three rock pinnacles. Vander Schaaf points out harbor seals lazing on the banks, and, just beyond, a couple of cormorants march in circles with their half-bent wings.

Netarts is one of two estuaries on the Oregon coast that have no major rivers flowing into them. Consequently, its waters are saltier because they are dominated by the influx of tidewaters. These conditions make the whole bay -- not just the mouth -- an ideal habitat for the Olys. Vander Schaaf says the bay formed as sand settled along the lee side of Cape Lookout, creating a finger-shaped spit of land two miles long. Once enclosed, finer, muckier sediments rolling down the foothills were trapped.

Wittwer cuts his engine and lets the boat float to the edge of the channel, where long tufts of eel grass swish back and forth in the wake. Vander Schaaf wades through the knee-deep water and anchors the boat to the submerged shelf of land. The second boat has anchored nearby. Jessica Miller, an ecologist from OSU's Hatfield Marine Science Center, and her three students stretch an enormous measuring tape across the plot. "Tell Pam to let go," Miller says to her student, Abby Nickels.

Nickels stands up to relay this order to Pam Archer, who -- according to the tape measure -- is exactly 197 feet away. "Let go!" she cries.

After setting up the outer dimensions of their plot, they subdivide it into 25 subplots. Each subplot will be treated with a different density of oysters, either five, 10 or 15 bags of them. Once that's done, they'll set up the second plot. Miller wants to see how the density of oysters affects their survival in the wild and what impact they'll have on eel grass, an essential habitat for salmon. Vander Schaaf says oysters, eel grass and chinook salmon coexisted on these flats long before humans arrived on the scene, but strict regulations on salmon habitats mean that any changes, conservation-minded or not, must undergo a rigorous evaluation.

### **Salmon may benefit**

The scientists know that oysters will influence salmon habitat, but they think oysters can only help. The native oysters glue themselves together, forming small reefs that can be several feet tall. An old map of Yaquina Bay shows the distribution of some of the long-gone oyster reefs, but no such map exists for Netarts. The flats are so dynamic it probably would be of little use. The oysters will add structure to the area, and, inevitably, they will displace some eel grass in the process.

Miller says, "Once you build any kind of structure, the water flow off the flat will change, and you may create some small channel areas." She says small chinook salmon may benefit from this complexity and that while the eel grass may vanish in some places, it will reappear in others. Overall, she thinks a direct impact to the transient chinook salmon will be hard to detect, but it is generally believed that habitat complexity and species diversity contribute to the stability of the ecosystem. The oysters, for instance, can keep populations of small algae in check, while crabs, snails and starfish may keep the oysters in check. As filter-feeders, oysters also improve water quality, which benefits all organisms living in the bay.

### **Fraction will survive**

When they were first harvested, Olys endured both a loss in numbers and a loss in habitat. Mud flats provide no solid surfaces that new larvae can cling to, and oysters need to cling. Oysters shoot threads out through their shells to attach to rocks, reefs or other oysters. To jump-start the restoration process, captive-reared Olys are allowed to attach to discarded shells of commercially harvested, non-native Pacific oysters. This is all done at the Whiskey Creek Shellfish Hatchery, a two-minute drive from the Netarts dock. In this tangle of giant vats and PVC pipes, owner Sue Cudd donated space to raise the native oysters.

Starting with a population of a hundred, Cudd was able to provide the conservancy with more than 5 million microscopic larvae of which only 1 percent are expected to survive. Oysters disperse during the larval phase, and one reason Olympia oysters have not reclaimed their historic range is that their larval phase is relatively brief.

By the time Miller is done laying out the plots, it is about 9 a.m. and the rest of the team has donned oyster-proof gloves and is hauling the 40-pound bags of shells across the mud and flattened eel grass. Vander Schaaf's wife, Marsha, hoists a bag on her shoulders, and an inky slurry drips down her gray sweat shirt. Afterward, she decides it wasn't such a bright idea: "When you have chest waders on, one thing you don't want to do is get water on the inside."

The morning sun casts shadows in the crisscrossing footprints -- each 6 inches deep -- that will be erased when the tide comes in. The other plot is already beginning to vanish under a thin layer of water. Dick Vander Schaaf says the water always flows out so fast, but then it trickles in like a bathtub with no perceptible current.

They're running out of time, and Miller announces a change of plans for the next plot. They'll sprinkle oysters on the first row of subplots, then they'll use a boat to carry the remaining bags out to the far edge of the plot. Wittwer, Miller and Marsha Vander Schaaf stack oyster bags on the bow of the boat and drag it through the shallow water.

As bags are removed one by one, a couple of crabs scamper helplessly on the boat's slick metal surface. Half a dozen larvae of the gunnel fish also stuck to the boat flip their bladelike tails in the air. It is a productive ecosystem, but there's just one thing missing. Wittwer lifts the last bag of oysters and tosses it into the water.

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