Are native oysters making a comeback?

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Which one is the native oyster?
The Pacific Oyster

Sea Cow (South Sound)

Blue Pool (Hood Canal)

Hama Hama (Hood Canal)

Scientific name: Crassostrea gigas
Cast of oyster species

- European Flat (Ostrea edulis)
- Eastern Oyster (Crassostrea virginica)
- Pacific Oyster (Crassostrea gigas)
- Pacific Oyster (“Shigoku”)
- Pacific Oyster (“Kusshi”)
- Kumamoto Oyster (Crassostrea sikamea)
- Olympia Oyster (Ostrea lurida)

How did the Japanese oyster become “our” oyster?

Gyotaku Artist: Bruce Koike
Pacific Oysters
• Up to 12 inches
• Fluted
• Rapid growth
• Less sensitive to conditions

Olympia Oysters
• Up to 3½ inches
• Oval
• Slow growth
• Sensitive to water conditions and drying out

Images: Marx Foods
“When the tide is out, the table is set”
Kloch Kloch

Art: Cory & Catska Ench
Oysters before 1850

Found from Alaska to Baja

Puget Sound:
10K-20K acres
13-27% of shoreline
30-36 embayments

Source: Brady Blake (WDFW) via PSRF
Ecological Function
Ecosystem Engineers
Early European Settlers

Fort Nisqually, established by Hudson Bay Company in 1833

http://www.narhist.ewu.edu/pnf/articles/s1/i-1/leschi/leschi.html
Willapa Bay “Oyster Boom”

Willapa Bay 1933, WA State Historical Society
Puget Sound “Oyster Mines”

Olympia 1910
“The Succulent Lobbyist”

Doane’s Oyster House, Olympia, 1880
Olympia History Spot
WA State Historical Society
Oyster “Bust”?
Oyster Bust?

Figure 1. *Ostrea lurida* harvest in Willapa Bay and Puget Sound. Data are from Washington Marine Fish and Shellfish Landings—Statistical Reports. A sack of oysters contained about 4,000 individuals.
Eastern Oysters

1905 Willapa Bay
UW Libraries Digital Collections

Pacific Blue Points, ca1900
WA State Historical Society
Hello *Crassostrea gigas*!

Nihojima (Japan) Toya grounds, 1904-5

UW Library Digital Collections
Japanese Seed Source

Figure 2. Cases of *Crassostrea gigas* seed imported to the United States west coast. Data to 1946 were compiled by Steele (1964) and afterwards by Scholz and Tufts (1977). One case (36” × 18” × 12”) held 110–160 pounds of shell with >10 small oysters on each. A small proportion of these data represent imports of species other than *C. gigas*.

See work of M.M. Booker, 2010
Fig. 3—Adult oysters spawning naturally on tray in large spawning tank.

Fig. 1.—Experimental oyster hatchery, showing outdoor equipment consisting of one large spawning tank and three rearing tanks with filter blocks in place.
“The Forgotten Oyster”

Images: WDFW, People for Puget Sound, BJ Becker
Harvest Rules

**ATTENTION CLAM HARVESTERS**

**KNOWN YOUR LIMITS!**
Combined Daily Bag Limit for all Hardshell Clams is 40 clams OR 10 pounds WHICH EVER COMES FIRST

Hardshell clams include Manila, butter, native littleneck, cockle, eastern softshell, and all other clams except:

- **DAILY BAG LIMITS**
  - Geoduck: first 3 dug per day
  - Horse Clams: first 7 dug per day
  - Razor Clams: first 15 dug per day

**FINES FOR OVER LIMIT HARVESTING BEGIN AT $100**
http://www.wdfw.wa.gov
http://www.wa.gov/wdfw

**ATTENTION OYSTER HARVESTERS**

**KNOW YOUR LIMITS!**
Daily Bag Limit is 18 Oysters Per Person Removed From the Shell

Oysters Eaten on the Beach Count Toward the Daily Limit

Minimum legal size is 2.1/2 inches in the shell

Oysters MUST beshucked on the beach
To provide habitat for young oysters and to prevent the spread of shellfish diseases and pests, shells MUST be left at the same tide height and on the same tideland where they were collected

**FINES FOR OVER LIMIT HARVESTING BEGIN AT $75 -$10 FOR EACH OYSTER FINES MAY DOUBLE FOR OYSTERS TAKEN IN THE SHELL**

**ATTENTION CLAM HARVESTERS**

**YOU MUST FILL IN HOLES CREATED WHILE DIGGING**

Failure to do so子孙s left to higher tides. Birds will

Beach Approaches Digging
Hel Reso Fines
Boutique Market

Culinary travel in the West

The West's native oyster makes a comeback

The Olympia oyster has been absent for almost a century. But now it's returning to our plates—and one taste will make you a believer.

Christopher Hall

On a chilly winter night at Seattle's Pier 56, I join the mob massing outside Elliott's Oyster House. As mobs go, we're a tame bunch, just some fleece-clad soul eager to get on with the serious business of celebrating the state's marquee mollusks. The annual event is billed as Oyster New Year, and ringing it in right means sharing a loading dock turned party space with 36,000 freshly shucked bivalves. I am about to experience the sound of 1,200 people slurping.

The doors open and I'm swept toward the 90-foot oyster bar manned by shuckers from just about every Puget Sound grower. It's a dazzling display of Northwest bounty, 30-plus varieties shucked and iced and ready to shoot. I'm tempted by frilly-shelled Pacifics and deep-capped Kumamotos, but tucked between these luxuriant shellfish are the oysters I seek: the tiny Olympias. The shells are no larger than a silver dollar, the meat inside each a small knob. I take one, slurp, and a briny smack of sea hits my mouth, followed by a wallop of nutty flavor and a bright, coppery finish that lingers for...
“100 acres by 2020”

- Betsy Peabody
- Brian Allen

Puget Sound Restoration Fund
Passive vs. Active Restoration
Olympia Oyster Life Cycle
Larvae are cute!
Larvae are relevant!

Pacific oyster larvae spawned in favorable (left) and unfavorable (right) seawater conditions

Day 1

Day 4

ΩAragonite = 1.64
pCO2 = 403 ppm
pH (total) = 8.00

ΩAragonite = 0.47
pCO2 = 1418 ppm
pH (total) = 7.49

Figure source: Elizabeth Brunner and George Waldbusser, Oregon State University
Larvae can move!

Can the restoration sustain itself?

Can the restoration sustain others?
Larvae are challenging to track

- Microscopic
- Long-lived
- Patchy but dilute
- Mixed in with lots of stuff
- Look alike
- Most will die

Lorenzo-Abalde et al. 2005
How do you sample larvae?

Henzler et al. 2010
Current Projects

Fidalgo Bay Oyster Larval Distribution

Ocean Acidification and Larval Behavior

Puget Sound Larval Dispersal

Blue Box indicates funding source
Where do oyster settlers come from?

- Fidalgo Bay
- Dyes Inlet
Elemental Fingerprinting

Fig. 1. Magnified photograph of the top-facing valve of a settled Ostrea lurida showing the three sources of exterior shell material. The dashed line represents the approximate boundary (not visible) between prodissococonch I (forming during brooding) and prodissococonch II. The black bars represent example locations of the three ablation passes performed during laser ablation analysis.
Dispersal Model

Becker et al. 2007

Carson 2010
Non lethal sampling of brooders

Thanks to Jake Heare
Collection of larvae

Thanks to Samish Tribe
Collection of settlers
Summer 2015 was a poor brooding year

- 13,870 oysters sampled
- 11,398 oysters opened
- 160 “white sic”
- 89 “grey sic”

But we got enough samples to do the analysis!

See Megan Hintz’s upcoming Master’s Thesis!
#BeckerLab

With thanks to Ed Echtle and White et al 2009 for much historical information
Connect with us!

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