

# QUARTERLY PROJECT REPORT

## April, 2026



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# OVERVIEW

The Alaska oyster industry has solely relied on the Pacific oyster (*Magallana gigas*) for shellfish farming. The “Other Mariculture Species” project, being conducted by Blue Starr Oyster Co., is working to build resilience and diversity in the sector by assessing the feasibility of growing novel oyster species: Kumamoto oysters (*Magallana sikamea*), Virginica oysters (*Crassostrea virginica*), and Olympia oysters (*Ostrea lurida*). Blue Starr Oyster Co. is leveraging its long-standing shellfish cultivation expertise to evaluate the growth potential of these species in Southeast Alaska and report on the results of each species’ grow-out.



## PROJECT UPDATE

This quarter (January - March 2026), the Other Mariculture Species project primarily focused on seed sourcing and continued permitting work through the winter, as the oyster seed in the farm was not being actively monitored.

It came to light at the end of last season, through observation and genetic testing, that the oyster seed purchased as Kumamoto in 2025 was most likely not true Kumamoto seed due to genetic contamination from Pacific Oyster broodstock in the hatchery process. Given these issues at the hatchery where that initial Kumamoto seed was sourced, it was necessary to find a new source for Kumamotos to continue the project into 2026. We worked with California-based Hog Island Oysters and their hatchery, which was recently permitted to send oyster seed to Alaska, to secure Kumamoto seed for delivery in the spring. We plan to send samples of this seed to UAF to run the same genetic tests conducted in 2025 and establish an understanding of the genetics of this incoming seed. Though Pacific Oysters and Kumamoto Oysters are very similar, they show obvious differences in genetics and physical attributes. It will be valuable to have more detailed genetic information about the Kumamotos to ensure quality and consistency of seed supply in the future in Alaska.

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We connected with state regulators in Alaska and Washington to better understand the barriers to acquiring seed for Olympia oysters, which are permitted to be grown in Alaska only if their seed meets the ADF&G regulations.

We spoke extensively with the Olympia oyster program representative from the Washington Department of Fish and Wildlife (WDFW) to understand the program in place in Washington for hatcheries and for restoration. Olympia oysters, which are native to Washington State, have historically faced major population decline and the WDFW works in collaboration with restoration organizations and oyster farmers to rebuild their populations. The WDFW program's mission is as follows:

*“The over-arching objective of WDFW guidance for native oyster restoration is the rebuilding of natural oyster bed habitat supported by self-sustaining populations of native oysters”<sup>1</sup>*

Olympia oyster cultivation is under strict regulation to ensure genetic diversity in the ongoing restoration efforts throughout the state. All hatcheries producing seed, either for restoration or cultivation, must adhere to the WDFW protocols for “restoration-grade” Olympia seed. Some protocol highlights include:

- *Broodstock must be collected from approved wildstock sources that avoids use of hatchery-origin oysters and must be of local provenance to the sub-basin where restoration is planned.<sup>1</sup>*
- *A minimum of 1,200 wild broodstock should be used for each production cycle.<sup>1</sup>*
- *Annual genetic analyses of each year’s hatchery production are strongly recommended. For each sub-basin brood, acquire tissue samples (n=50) and analyze genetic diversity metrics of hatchery reproductive output destined for each population/area being restored. These metrics should be compared to those of a representative independent wild sample (n=50) from the same area.<sup>1</sup>*
- *Certify brood animals by a qualified histopathologist for disease-free status according to accepted OIE standards.<sup>1</sup>*

The full **WDFW Protocols for Hatchery Production of Native Olympia oyster (Ostrea lurida) Seed for Restoration** can be found attached to this report.

<sup>1</sup>Brady, B., Martinelli, J., & Eardley, C. (2025). WDFW Protocols for Hatchery Production of Native Olympia oyster (Ostrea lurida) Seed for Restoration. Zenodo. <https://doi.org/10.5281/zenodo.15932967>

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The main takeaway is that restoration-grade Olympia seed must be sourced from wild broodstock every year. And, even though each Olympia broodstock cohort must be certified by a qualified histopathologist as disease-free, this protocol does not align with the requirements from the Alaska Department of Fish and Game (ADF&G) for oyster broodstock. ADF&G requires that the broodstock be derived from captive oysters commercially cultured on the Pacific Coast of North America through three or more generations so that a disease history can be established. This unfortunately creates a catch-22 between Alaska and Washington’s regulatory framework, where if a hatchery in Washington is adhering to the State’s regulations, the resulting seedstock is not allowed to enter Alaska, and if a hatchery produced seed that met the Alaskan regulations, it would not be allowed to be distributed in Washington.

It is unlikely that a hatchery in Washington, or elsewhere, would begin an Alaska-centric, three-year broodstock program for Olympia oysters, especially given that their growth and end market have not been showcased in Alaska (something this project sought to accomplish). It is also unlikely that ADF&G will review and shift its regulations to align with Washington State’s restoration-grade hatchery protocol. Therefore, this project will not meet the objective of a cultivation trial for Olympias.

We look forward to monitoring the growth of the new Kumamoto cohort and the ongoing Virginicas and Pacific oyster control group throughout the 2026 season to establish the growth rates of two new oyster species in Alaska.

## FINANCIALS

The project budget is currently on track for anticipated spending for this quarter. Funds have been requested for personnel time, project supplies, and contractor time as per the budget. Attached to this report are the budget and invoice records for reference.

<b>Total Project Budget Approved</b>	<b>Previously Expended</b>	<b>Amount Currently Requested</b>	<b>Amount Remaining</b>	<b>% Spent</b>
\$80,200.00	\$31,832.09	\$2,610.95	\$45,756.96	43%



State of Washington

## DEPARTMENT OF FISH AND WILDLIFE

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### **WDFW Protocols for Hatchery Production of Native Olympia oyster (*Ostrea lurida*) Seed for Restoration**

*The over-arching objective of WDFW guidance for native oyster restoration is the rebuilding of natural oyster bed habitat supported by self-sustaining populations of native oysters.*

This document contains:

- 1) Guidelines for when to use seed supplements in restoration.
- 2) A list of current requirements for the hatchery production of restoration-grade native oyster seed.
- 3) Background and requirements to minimize genetic risk by maintaining and protecting genetic integrity of populations within Puget Sound and the Washington coast.
- 4) Details on Composite Broodstock Zones in the five Puget Sound sub-basins identified by WDFW.
- 5) Recommendations for archiving tissue samples.
- 6) Requirements to minimize the introductions or spread of diseases and pests associated with using hatchery-produced animals for restoration.

#### **1. When to use seed supplements**

As some embayments hosting restoration sites support natural production and recruitment of Olympia oysters (and as others will eventually), not all sites are candidates for hatchery seed. WDFW emphasizes habitat enhancement (e.g. shell placement) over planting of hatchery-produced seed at such sites.

*Restoration sites for the placement of hatchery seed vs. clean cultch must be approved by WDFW.*

As a first approach to determine whether a site supports natural recruitment of Olympia oysters, we suggest conducting surveys to understand populations—including quantifying abundance, characterizing demographics, and characterizing habitat. We also suggest deploying spat collectors (recruitment stations) three or more years in advance of the start of a potential restoration project. Puget Sound Restoration Fund and partners have been monitoring larval recruitment Sound-wide since 2014. A map of the locations can be found [here](#), and a manual to build and deploy your own spat collector can be found in the References section (available upon request).

Currently, small volumes of Olympia oyster seed are being produced in a limited number of hatcheries for aquaculture purposes. When possible, restoration-grade oysters or larvae are favored for this application. Otherwise, hatchery production of Olympia oysters for commercial purposes will be expected to abide by WDFW's genetic risk management requirements for aquaculture. Aquacultured Olympia oysters are intended for short-term deployment (grow-out) and removal and generally involve lower quantities of oysters than for restoration. Hatchery production for restoration purposes in commercial hatcheries must abide by the same requirements being utilized by NOAA's Kenneth K. Chew Center for Shellfish Research and Restoration operated by the Puget Sound Restoration Fund.

#### **2. Requirements for production and use of hatchery seed for native oyster restoration:**

- Proposals for hatchery-production and use of native oyster seed for restoration must be submitted to WDFW for review and approval.

- Sourcing of broodstock and planting of seed must be in accordance with WDFW’s sub-basin approach, where broodstock must be sourced from the same basin intended for seed outplant (e.g. seed produced from South Sound broodstock can only be planted in South Sound).
- The Washington coast (Willapa Bay and Grays Harbor) has native oyster populations that are genetically distinct from Puget Sound. All native oyster restoration projects on the Washington coast should only use broodstock from the coast, and all the seed produced from this broodstock should only be outplanted on the coast.
- Broodstock must be collected from approved wildstock sources that avoids use of hatchery-origin oysters and must be of local provenance to the sub-basin where restoration is planned. Due to restoration outplants in some broodstock collection areas, the populations will trend initially towards being largely composed of  $F_{1(H)}$  and  $F_{2+(H \times H, H \times W)}$ . Ceasing hatchery outplants into a location would allow a population to trend towards being largely composed of  $W \times W$  composition.
- Minimize inbreeding by using a large geographically proximate broodstock population. Alternatively, composite broodstock collected from geographically proximate populations within a sub-basin can also be used.
- A minimum of 1,200 wild broodstock should be used for each production cycle. Note that the Puget Sound Restoration Fund attempts to collect 1,500 to account for any mortality prior to or during spawning. Broodstock may only be used to produce a single year’s cohorts and must be refreshed annually.
- Use volitional mass-spawning methods to spawn all 1200 (or 1500) broodstock together.
- Once oysters spawn, collect larvae for a minimum of four weeks. Oysters may spawn multiple times during this time. Depending on production goals, larvae may need to be culled, sometimes up to 50-75% daily. Culling must occur evenly at the onset of larval release throughout the entire broodstock production period, to avoid introducing a bias by artificially skewing larval representation within a given cohort.
- For public tidelands, WDFW requires that broodstock are returned to a location adjacent to the site of collection (to avoid collecting same individuals in the future) after spawning to avoid broodstock mining. We define an ‘adjacent location’ as a location *within* the same beach proximal to where broodstock were collected. WDFW recommends returning broodstock collected from private tidelands in the same fashion as with public tidelands-derived broodstock.
- Collection of broodstock, planting of seed, and return of broodstock to source locations require WDFW transfer permits. Visit <https://wdfw.wa.gov/licenses/fishing/shellfish-import-transfer> for more information, or contact [shellfishpermits@dfw.wa.gov](mailto:shellfishpermits@dfw.wa.gov). Collection also requires a Scientific Collection Permit <https://wdfw.wa.gov/licenses/environmental/scientific-collection>.

### 3. *Ostrea lurida* Population structure and Conservation Genetics Guidelines

The information below provides more detail on how to protect and maintain the genetic structure observed for *Ostrea lurida* populations in Puget Sound and the Washington coast. More details about genetics research on native oysters, and differences in populations between sub-basins can be found in Camara & Vadopalas 2009, Stick et al. 2009, Stick 2011, Heare et al. 2017, White et al. 2017, Silliman et al. 2018, Silliman 2019a, Silliman 2019b, Spencer et al. 2023, Silliman et al. 2023.

#### *Minimize among-population effects*

Use locally-derived broodstocks. Locally-derived is defined as the geographically closest and/or ecologically most similar and viable source population. WDFW further utilizes a “Sub-basin” or “Composite Broodstock Zone” approach to apply this principle (see below) – hatchery production must utilize broodstock from within the same sub-basin as intended seed out-plant.

#### *Minimize within-population effects*

Maximize the ratio of genetically effective numbers of breeders ( $N_b$ ) to broodstock census size ( $N$ ) and maximize genetic diversity. This  $N_b : N$  ratio can be maximized by using Volitional Mass Spawning. As mentioned above, the current

requirement is for a minimum of  $N_B=1200$  oysters for broodstock. We have designated Composite Broodstock Zone (see details below) within the five sub-basins of Puget Sound identified by WDFW. Within these Composite Broodstock Zones (CBZ), broodstock should be rotated from year to year. That is, the same site within a zone/sub-basin should not be used for collections annually. The exception to this is Fidalgo Bay as it is the only site in North Sound with populations that can be used for broodstock collection.

WDFW does not currently permit selective breeding of *Olympia* oysters.

#### **4. Composite Broodstock Zones in Puget Sound sub-basins (potential broodstock sites in parentheses):**

- North Sound – (Fidalgo Bay).
- Strait/Admiralty Inlet complex – (Port Gamble Bay, Discovery Bay, Sequim Bay).
- Hood Canal – (Dabob Bay, Dosewallips State Park, Triton Cove State Park, Potlach State Park, DNR-48).
- Central Sound – (Liberty Inlet, Dyes Inlet, Sinclair Inlet).
- South Sound – (North Bay, Skookum Inlet, Totten Inlet, Eld Inlet).

#### **5. Archiving of tissue samples**

Annual genetic analyses of each year's hatchery production are strongly recommended. For each sub-basin brood, acquire tissue samples ( $n=50$ ) and analyze genetic diversity metrics of hatchery reproductive output destined for each population/area being restored. These metrics should be compared to those of a representative independent wild sample ( $n=50$ ) from the same area. Tissue samples can be archived if funding to conduct analyses is not currently available.

Tissue samples (ideally from the adductor muscle) should be collected immediately prior to field transfer and care should be taken to minimize contamination, and ensure the sampling is representative of the entire group. Tissue samples should be stored in 95% non-denatured ethanol and if possible, kept in a refrigerator. Make sure to label the samples with broodstock collection origin and date collected. Notes on other relevant details, such as number of broodstock used, mortality rates, total seed produced, etc. should also be maintained as supporting information for samples.

#### **6. Requirements to avoid disease transfers**

WDFW also seeks to minimize the risk of accidental introduction or spread of disease or pest organisms associated with restoration activities. The essential requirements of disease control and prevention related to native oyster restoration are:

- Certify brood animals by a qualified histopathologist for disease free status according to accepted OIE standards. WDFW requires a general histopathology exam as well as examination via PCR for *Bonamia* spp. on animals collected mid-summer. A Shellfish Transfer Permit from WDFW is required to ensure low risk of potential disease or pest spread or introduction.
- Certify hatchery-produced seed by a qualified histopathologist for disease-free status according to accepted OIE standards. A Shellfish Transfer Permit from WDFW is required to ensure low risk of potential disease or pest spread or introduction.
- Sample seed animals in numbers sufficient to provide 95% confidence of detecting a pathogen with prevalence as low as 5% (this is typically  $n=60$  animals).
- Return brood animals to CBZ of origin after use when disease-free status of the broodstock population is known. A Shellfish Transfer Permit from WDFW is required to ensure low risk of potential disease or pest spread or introduction.
- WDFW shellfish transfer permits are required for transfers of broodstock to and from the hatchery, for transfers of seed from the hatchery, and for seed to restoration sites.
- Shell (cultch) used for habitat enhancement or for setting seed must come from WDFW inspected and approved (permitted) sources.

- WDFW does not permit “shell recycling,” or using shell from sources not approved for use by WDFW (e.g. restaurants, other sources that have not been inspected and approved).
- Conditions to ensure broodstock and seed transfers do not carry unwanted hitchhikers such as oyster drills and European green crab will accompany transfer permits.
- Additional permit conditions may apply depending on specifics of facility or circumstance.

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