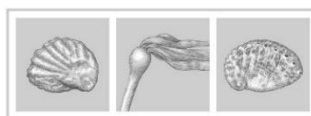
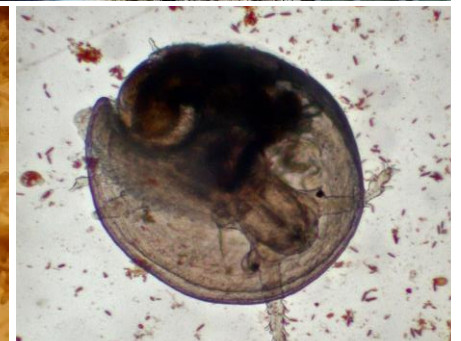
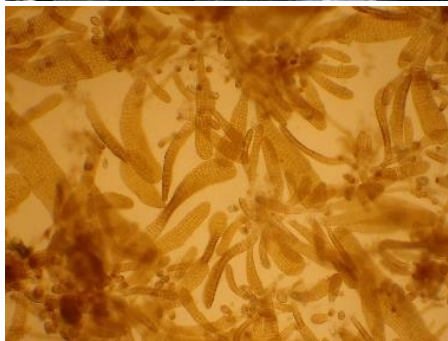




The Kenneth K. Chew Center for Shellfish Research & Restoration **A CONSERVATION HATCHERY**

In 2014, Puget Sound Restoration Fund (PSRF) began operations at NOAA's Northwest Fisheries Science Center's Kenneth K. Chew Center for Shellfish Research and Restoration, a new NOAA facility dedicated to research and production of native shellfish and other Pacific Northwest living marine resources in partnership with PSRF. Development of a conservation hatchery was identified as a high-level need in both phases of the Washington Shellfish Initiative and in the Blue Ribbon Panel Reports on Ocean Acidification (2012 and 2017). The facility, located at NOAA's Manchester Research Station, is operated by PSRF through a cooperative research and development agreement with NOAA to collaboratively conduct and manage research and restoration activities.

To date, PSRF has produced over 11 million Olympia oysters, more than 21,000 pinto abalone at the Chew Center and NOAA's Mukilteo Station, established a kelp lab to propagate native kelp species, and have active programs to produce cockles and sea cucumbers. The hatchery is invaluable to PSRF and to marine research and restoration throughout Puget Sound.



**PUGET SOUND
RESTORATION FUND**



Olympia oyster restoration Olympia oyster (*Ostrea lurida*) seed produced at the hatchery helps rebuild breeding populations of this native bivalve in 19 priority locations in Puget Sound to support on-the-ground restoration efforts.



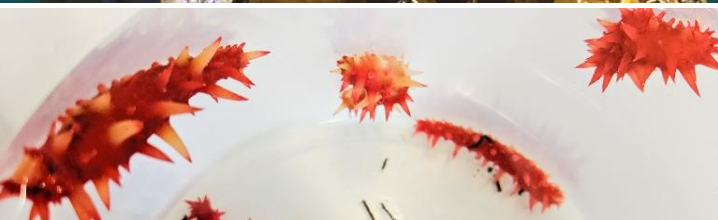
Pinto abalone rebuilding PSRF, WDFW and partners have developed state-of-the-art techniques to raise native pinto abalone (*Haliotis kamtschatkana*) at the hatchery. ~21,500 juveniles have been outplanted since 2009, in efforts to restore this vanishing species.



Bull kelp restoration PSRF is leading the development of bull kelp (*Nereocystis luetkeana*) restoration methods and collaborating on a recovery plan for this native, canopy-forming species. Our kelp lab, established with NOAA, can propagate bull kelp both for restoration and mitigation.



Sugar kelp cultivation With funding from the Paul G. Allen Family Foundation and the U.S. Navy, PSRF cultivates sugar kelp (*Saccharina latissima*) on spools at the hatchery, which are then outplanted and harvested, to research the ability of sugar kelp to improve seawater conditions or shelter sensitive species.



Sea cucumber seed production PSRF is working with partners to develop hatchery technologies for giant red sea cucumbers (*Parastichopus californicus*) that improve production reliability, hatchery efficiencies and fill critical knowledge gaps in the culture of these unique invertebrates.



Cockle cultivation To improve access to this native species of high cultural significance for subsistence harvest, PSRF is working with the Suquamish Tribe to develop techniques to propagate basket cockle (*Clinocardium nuttallii*) seed at the hatchery.

Capabilities

- Continuous filtered seawater supply
- Temperature/pH controlled seawater
- ocean acidification research
- microalgae culture
- kelp propagation & research
- floating dock, FLUPSY & tideland nursery

Research Priorities

- Culture genetically-diverse native oysters and pinto abalone for restoration
- Expand the ability to restore native shellfish habitat in the region
- Understand impacts of ocean acidification on shellfish and other marine life
- Improve monitoring of seawater chemistry
- Establish a center of excellence for research, restoration and aquaculture

PHOTOS. Front: 1. micro-algae greenhouse, 2. Olympia oyster setting tanks, 3. kelp gametophytes for propagation, 4. 3-week old post-set abalone. Back: 1. juvenile Olympia oysters set on Pacific oyster shell, 2. tagged hatchery-reared juvenile abalone ready for outplanting, 3. bull kelp blade with sorus patches collected for propagation, 4. sugar kelp at Hood Head kelp farm, 5. hatchery-produced juvenile sea cucumbers, 6. cockle broodstock.