

2025 Washington Sea Grant Keystone Fellowship Project Information

Host Office and Work Location(s)

[Puget Sound Restoration Fund](#)

Main Office: 8001 NE Day Rd, Bainbridge Island, WA 98110

Conservation Hatchery: 7305 Beach Dr East, Port Orchard WA 98366

Home office + Fieldwork travel: Skagit and Jefferson counties

Fellowship Supervisor(s)

Primary:

- **Emily Buckner**, Crab Program Manager and Sea-Land Program Co-Lead
- **Hannah Garfield**, Sea-Land Program Co-Lead & Engagement Specialist

Restorative Mariculture Fellowship Overview

Many intertidal shellfish farmers struggle to manage seaweed that can accumulate in staggering volumes on cultivated gear. These seaweeds - especially green *Ulva* (aka 'sea lettuce') – grow quickly and abundantly during warm months, fueled by nutrients from upland sources, the ocean, and the shellfish themselves. When these blooms decompose, the carbon and nutrients they've absorbed over the growing season are rapidly released, triggering processes that acidify seawater and decrease dissolved oxygen, creating poor local water quality for the cultivated shellfish (i.e. the farmer's livelihood) and co-residing marine organisms.

While excess carbon and nitrogen in seawater is causing problems for shellfish growers, the opposite is true for land farmers, whose soils often suffer from *too little*. A common method for boosting soil carbon is the application of compost or mulch, which also supplies nutrients and improves water retention. Commercial compost can be costly however, and many Puget Sound farmers are interested in the potential of seaweed—which also contains valuable micronutrients and biostimulants—as an alternative. Repurposing seaweed as a soil amendment could mean healthier farms and lower costs for sea and land farmers alike, as well as potential marketing opportunities and/or premiums stemming from implementation of innovative climate-smart practices.

This fellowship position joins an interdisciplinary team of farmers, researchers and conservation practitioners to [pilot a novel and mutually beneficial collaboration](#) between aquatic and

terrestrial farms in the Puget Sound region, revolving around the removal and reconveyance of seaweed for application as a carbon-boosting soil amendment on small regional farms. *The position is geared towards an individual who is interested in joining the mariculture workforce or an industry-adjacent role, such as mariculture research.*

Primary Project - Seaweed is incredibly heavy when wet and decomposes quickly when removed from the marine environment. This creates a challenge when developing a farm to farm market, as moving large volumes is logistically challenging and expensive, made even more so by the short timeline. Drying seaweed therefore, is an essential step to stabilizing the product, allowing shellfish farmers to stockpile throughout the algae fouling season, and deliver a significantly lighter load to terrestrial farms. Drying wet seaweed in our cool and wet Pacific Northwest climate is easier said than done however, and not all shellfish farmers have the access or capacity to dry their seaweed harvests. This fellowship project will fill this critical niche in the seaweed market pathway - developing effective drying strategies for partner shellfish farms, providing hands-on technical support to build up drying infrastructure, and facilitating the transport and processing of the dried seaweed to receiving terrestrial farms.

Additional projects/opportunities for professional development:

- Lead monitoring efforts of water quality, benthic invertebrate assemblages, and cultivated shellfish growth and survival to assess the impacts of seaweed accumulation and harvest - designing the monitoring framework, managing instruments and sampling, and analyzing data.
- Work at PSRF's Conservation Hatchery to learn about hatchery cultivation techniques for shellfish (olympia oysters, pinto abalone, and cockles) and bull kelp.
- Occasional work on local shellfish farms around Puget Sound to learn about day to day operations and field cultivation techniques
- Observe and assist state and tribal biologists in shellfish resource monitoring efforts
- Work on additional PSRF field monitoring efforts (bull kelp and olympia oyster restoration, Dungeness crab population monitoring)
- Network and present monitoring results at the Pacific Coast Shellfish Growers Conference, Washington Sea Grant's Shellfish Conference, and Washington Seaweed Collaborative meetings

Desired qualifications/skills and additional considerations:

- A valid driver's license and openness to travel for site visits/field work. The primary field work for this fellowship will be located in north Hood canal and in Skagit county. There will be frequent (at least weekly) travel to these sites April-September. Depending on the fellows interest, additional field opportunities may occur through the Puget Sound region.
- Experience (Master's level OR 2 years professional experience) in water quality monitoring, experimental design, R or Excel, and statistical analyses. This experience is particularly relevant if the fellow is interested in the on-farm monitoring efforts described above.
- Good problem-solving skills and willingness to adapt in the face of a dynamic environment and the fluid needs of the larger project group.

A Fellowship at Puget Sound Restoration Fund

Puget Sound Restoration Fund (PSRF) is a small non-profit dedicated to designing, testing, and spearheading in-water actions to restore Puget Sound's marine habitats, species, and waters - for both people and place. Our Sea-Land team (mentors Emily and Hannah) have been working for several years with shellfish farmers to identify water quality concerns stemming from 'nuisance' seaweed, develop harvesting strategies, and connect with upland partners. Our collaboration under the 'Blue Carbon-Green Fields' (BCGF) project has allowed us to scale up these efforts and better understand the potential value of seaweed to terrestrial farmers. This fellowship position will be fully integrated into our PSRF Sea-Land team and the larger BCGF collaboration.

While specific projects and roles under BCGF have been outlined above, we firmly believe that a fellowship is first and foremost an opportunity for personal and professional growth and development - so the mentors will prioritize 1) working with the fellow to create a fellowship plan to outline and ensure professional development goals are met and 2) facilitating access to opportunities, experiences, and partners as outlined by the fellow's plan and interests (including additional mentors who can best support the interests of the fellow). Above, we list many of the opportunities available to a PSRF fellow, including across our different programs and with our many partners (Tribes, state agencies, industry members, and other non profits). A PSRF fellow will also have the ability to choose their work environment - whether that be their home office or our main office - though they should expect regular travel to farm and field sites, particularly in the spring and summer months (as described in more detail above).

Keystone Alignment Statement

PSRF is thrilled at the opportunity to host a Washington Sea Grant Keystone fellow and offer first-hand experience working on a project that helps us better understand, conserve, and use Washington's ocean and coastal resources, while building pathways into marine related careers for individuals who are historically underrepresented in those fields. We recognize that PSRF is a white-led non-profit; we have consciously committed to incorporating JEDI principles into our work and organization - from hiring practices, board recruitment, employee policies, and partnerships. In practice, much of PSRF's work is co-created with Tribes, as we firmly believe that our in-water actions should be guided by those who have stewarded coast Salish waters since time immemorial. PSRF will continue to improve our efforts to seek environmental justice, and strive for racial equity and inclusion, particularly when considering who restoration projects benefit and how we locate and perform restoration actions.