BURROWING SHRIMP

Finding a Sustainable Solution for the Infestation Threatening Shellfish Farming in Southwest Washington

The Local Shellfish Economy

Oysters are the oldest agricultural crop in Washington State. Native Americans have gathered shellfish for centuries and settlers provided barges of oysters for San Francisco restaurants during the California Gold Rush.

Shellfish aquaculture continues to be a critical economic driver for the state economy, especially in the rural communities of Southwest Washington.

The industry is the life blood for the small towns along Willapa Bay and Grays Harbor where multi-generational families have been farming nearly 12,000 acres of privately owned tidelands, many since before Washington statehood.

Washington State shellfish exports are worth hundreds of millions of dollars each year and the industry is the cornerstone of employment in many rural areas where jobs are often hard to come by.

The Problem

In Willapa Bay and Grays Harbor, shellfish farmers face an existential threat from a persistent infestation of burrowing shrimp, which can render productive shellfish beds into desolate mud flats in a single season. High population densities of burrowing shrimp soften the tide flats and cause shellfish to sink and suffocate.

In the past, growers used pesticides to manage the burrowing shrimp populations but public concern about use of the chemicals forced changes. Numerous techniques including alternative pesticides, mechanical control, electricity, and even microwave blasts have been tested, but growers still lack an effective management program and farms are rapidly losing productive acreage; some have gone out of business. The search for a solution continues with research trials of other alternative products and techniques.

The IPM Working Group

In 2019, Willapa Grays Harbor Oyster Growers Association (WGHOGA) and the Department of Ecology (Ecology) agreed to work together to identify an integrated approach to control the burrowing shrimp infestation that is devastating oyster beds in Willapa Bay and Grays Harbor.

They agreed the Integrated Pest Management (IPM) plan would include chemical and non-chemical controls, with the goal of minimizing chemical use and maximizing the effectiveness. They also established a IPM Working Group with representatives from the Departments of Agriculture, Natural Resources, Commerce, Washington Sea Grant, and the Conservation Commission. The Shoalwater Bay Indian Tribe is now represented in the group.

The Working Group is developing the framework for identifying “treatments to reduce populations of burrowing shrimp to below established thresholds using biological, cultural, mechanical, and chemical control methods,” and “evaluating the environmental effects and efficacy of burrowing shrimp treatments.”

To inform this process, the IPM Working Group has commissioned several studies to develop a replacement for imidacloprid and create the framework for a new IPM plan. The initial stages of this research included lab studies to identify potential low toxicity insecticides or repellents that may be implemented into an IPM. Studies to better understand burrowing shrimp populations, density, and recruitment patterns.

IPM INTEGRATED PEST MANAGEMENT WORKING GROUP

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Finding a Working Solution

To date, testing and research have not identified a viable and effective pest management solution and more funding is needed to find a burrowing shrimp control method that ensures the continued prosperity for Southwest Washington's farming community.

Research Grants

In the 2020 supplemental budget, the state legislature provided $650,000 of the Model Toxics Control operating account to WSDA for research grants to assist with the development of an integrated pest management plan to address the problem and facilitate continued shellfish cultivation on tidelands. In 2021, the Legislature provided another $1.29 million from MTCA for additional research.

Based on recommendations from the working group, WSDA awarded the following research projects:

$92,484 · Pacific Conservation District

Study in collaboration with NOAA and Pacific Northwest National Laboratory to refine newly developed remote sensing capabilities to efficiently monitor burrowing shrimp densities in intertidal tidelands of Willapa Bay and Grays Harbor.

$82,498 · Paradox Natural Resources

Field study using Rhodamine WT Dye to estimate movement of chemicals on shellfish beds to non-treated areas.

$27,697 · University of Washington

Field study to sample shrimp densities with coring techniques, oyster position relative to sediment surface, size frequency of live and dead oysters, sediment organic content and grain size.

$25,842 · Pacific Shellfish Institute

Development of an Integrated Pest Management plan framework that can be used by commercial shellfish farms for ongoing burrowing shrimp management in Willapa Bay and Grays Harbor.

$381,792 · Paradox Natural Resources

Laboratory and field study to test chemicals for control of burrowing shrimp to be used in the development of an integrated pest management plan.

$332,000 · Paradox Natural Resources

Continue field studies to test chemical and mechanical control of burrowing shrimp.

$124,000 · University of Washington

Conduct a field study with objectives that address causes and consequences of variability in burrowing shrimp populations and the impact on oyster performance.

$150,000 · University of Washington

Test the impacts of mechanical control for burrowing shrimp through pre- vs post-treatment comparisons and by comparing nearby treated and untreated beds.

$40,000 · Groundswell Communications

Conduct review and analysis of the IPM Working Group's current resources and develop stakeholder communications and coordination strategy.

$40,000 · Pacific Shellfish Institute

Provide a facilitated update of industry led Best Management Practices that include an IPM to address burrowing shrimp.

$150,000 · Washington Sea Grant

Assist with the Ecosystem Based Management Collaborative as it relates to the IPM work.