Kelp Seed Quality Improvement

Midterm Progress Report

Alaska Nursery Workshop participants outside the Prince William Sound Science Center in August.

Project: Kelp Seed Quality Improvement
Funder: Southeast Conference – Alaska Mariculture Cluster Grant
Implementing Organization: GreenWave
Reporting Period: June–November 2025
Project Lead: Lindsay Olsen, GreenWave

Project Overview

The Kelp Seed Quality Improvement project aims to address inconsistent seed quality across Alaska's kelp nurseries by standardizing protocols, improving infrastructure, and introducing alternative seeding methods. More importantly, the initiatives will foster a statewide Community of Practice among nursery operators for continued learning and knowledge exchange, with the ultimate goal of increasing average yields on kelp farms across the state of Alaska, leading to a more profitable and sustainable industry.

Summary of Progress

Task 1 – Alaska Nursery Operators' Workshop

Goal: Convene Alaska's nursery operators to standardize protocols and build shared knowledge.

Planning and Preparation (June–July 2025): GreenWave initiated detailed planning in partnership with Alaska Sea Grant, including developing a comprehensive workshop agenda, organizing travel logistics and managing all outreach and communication to participating nurseries. To ensure the workshop content reflected the most pressing issues facing Alaska's nursery operators, GreenWave created and distributed a pre-workshop survey to gather participant input on the agenda. Through the planning process GreenWave collaborated with a facilitation coach and educational consultant EdMaker to refine content, activities, and workshop flow to ensure a high-quality experience for participants.

Implementation (August 2025): The three-day Alaska Nursery Operators Workshop was held August 12–14, 2025, in Cordova, AK, at the Prince William Sound Science Center (PWSSC). Fifteen nursery operators from eight Alaskan nurseries attended, along with Thew Suskiewicz and Cara Blaine, two guests from Atlantic Sea Farms in Maine. The three days were focused around the themes of Infrastructure; Sorus Prep & Spore Release; and Routine Tasks & Operations. Within each section, nursery operators were requested to describe the details of their system or protocol for the entire group, with a facilitated focus on differences of approach. Then there was an accompanying hands-on portion that included a demonstration of GreenWave's protocols, and a discussion of how these methods could be implemented in nurseries across Alaska.

Overall there was great participation and engagement from operators. Participant evaluations of the workshop averaged 4.9/5 for overall satisfaction and 4.25/5 for “how confident do you feel going into the upcoming season.”

Clockwise from top left: Participants discussing details of nursery production, Atlantic Sea Farms’ nursery manager Thew Suskiewicz judges a sorus tissue cleaning competition, spore release demonstration for seeding seed spools; spore release demonstration for seeding gametophyte cultures.

Status: 100% complete.

Outputs: Workshop completed; 15 participants trained; customizable nursery SOP templates drafted and shared with participants; GreenWave’s Kelp Nursery Operations Manual is published online.

Photos & Video: Nursery Workshop Photo Album, Nursery Workshop Videos

Task 2 – Support for Selected Nurseries

Goal: Improve existing infrastructure across all Alaskan kelp nurseries, and provide direct technical support to 2–3 nurseries.

Over the summer, GreenWave staff reached out to all active kelp nurseries in Alaska and conducted virtual interviews about their nursery infrastructure, focusing on any challenges or issues they had been facing with their existing systems. Based on these conversations, as well as those at the Nursery Operators Workshop in August, GreenWave has purchased small equipment and supplies to support improvements across six nurseries. We have made multiple attempts to contact the Native Conservancy and Alaska Ocean Farms, but these entities have yet to indicate their preferred investment. In sum, $24,543 in funds have been spent on infrastructure improvements and nursery supplies through September. It should be noted that some nurseries wanted to wait to make infrastructure improvements until after the fall 2025 production season, due to ordering lag times. Those nurseries will implement their infrastructure improvements before the fall 2026 production season.

In addition to customized upgrades, GreenWave worked with C.A. Goudey & Associates to prototype, refine, and manufacture a custom-built seedspool winder. The winder was demonstrated during the workshop in Cordova, and seven units were shipped statewide for deployment.

This fall, GreenWave staff supported three nurseries with hands-on consultation, infrastructure setup, and spore release: the PWSSC nursery, Alutiiq Pride Marine Institute (APMI), and the Kodiak Ocean Growers nursery. In advance of the Nursery Operators Workshop, GreenWave staff accompanied Prince William Sound farmers to collect and prepare sorus tissue. We also supported final installation of the water filtration system, tank setup, and spool winding. As part of workshop demonstrations, we prepped and seeded over 34,000 ft of sugar kelp in the PWSSC nursery. This seed was outplanted in Prince William Sound the first week of October, the earliest ever outplanting in the region. The seed was also the highest quality that the region has received, and early images of farm growth show the kelp to be highly productive and larger than usual for this time of year.

In late August, GreenWave staff also traveled to APMI to support final infrastructure installation and the first round of spore release. GreenWave staff visited APMI a second time, after the nursery season, as well to conduct a retrospective. The support GreenWave staff provided to the Kodiak Ocean Growers, the third nursery supported, is detailed in the section under “Task 4.”

Status: Approximately 70% complete.

Outputs: Equipment deployed to 6 nurseries, 3 nurseries received hands-on support for spore release.

Clockwise from top left: Farmers picking up spools for outplanting from the PWSSC nursery; a second run of sugar kelp seed spools in the PWSSC nursery started in late October; kelp growth progress (as of 11/10/25) on Noble Ocean Farms of seed outplanted in early October.

Task 3 – Building a Community of Practice

Goal: Foster community and shared learning through increased communication among Alaska's nursery operators.

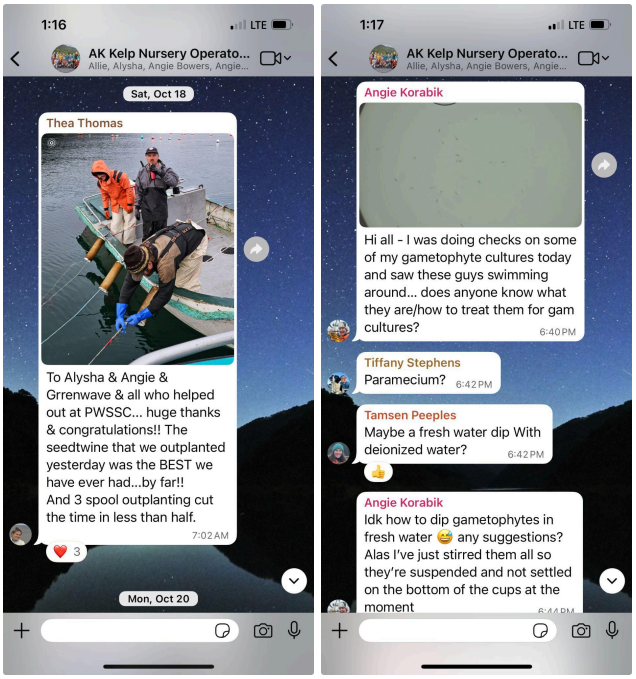
At the end of the Nursery Operators Workshop, participants discussed options for ways to stay in closer communication and collaboration throughout the nursery season. The group voted to start a shared messaging channel hosted on WhatsApp. The "AK Nursery Operators" channel was created at the workshop, and all participants and non-attending Alaskan nursery operators were added to the group. Over the course of the seed production season, the channel has been active with more than a dozen regular contributors who share photos, ask for advice, and troubleshoot contamination.

Additionally, at the end of the workshop, participants voted to have GreenWave prepare a customizable Nursery SOP Template where operators could compile and organize their nursery-specific guidance for their own reference and training new employees. In addition, participants requested a digital and printed version of GreenWave's nursery operation protocols, which at the time were only available on the GreenWave Hub. As a result of this request, GreenWave supplied a template SOP within two weeks of the nursery workshop, and engaged with EdMaker, an educational consultant partner, to produce an updated SOP guide based on GreenWave's protocols that incorporated input from nursery operators in Alaska. This guide was distributed digitally in October of 2025. The print version is currently in publication, and slated to be distributed in early 2026.

To meet future communication targets, the group also agreed to attend a post-season debrief call, scheduled for January 2026, and another meeting after the 2026 kelp harvest.

Status: Approximately 90% complete.

Outputs: Communication network established; draft SOP template distributed; GreenWave Nursery Operations Handbook digital version published, print version in production.



Screenshots of discussion on the shared Alaska Nursery Operators WhatsApp group

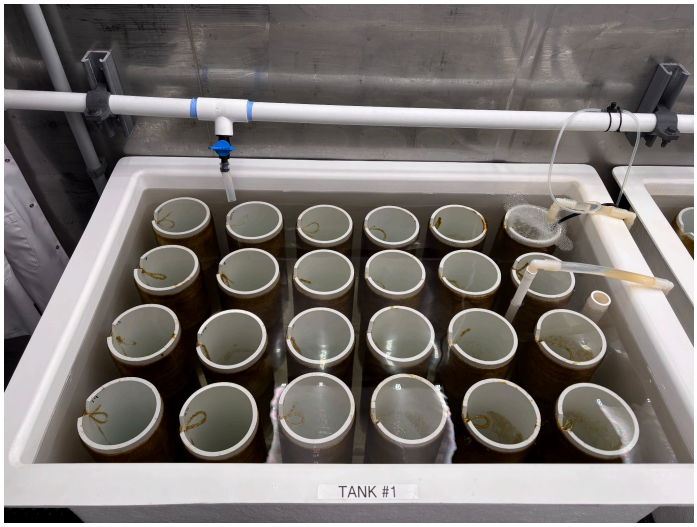
Task 4 – Kodiak Pilot Project

In July, Allie Conrad was contracted as Kodiak Nursery Manager for the 2025–26 season and completed intensive training at GreenWave's Connecticut nursery. In August, GreenWave staff traveled to Kodiak to receive the containerized nursery that had been fabricated on the east coast and shipped to Kodiak. Working in collaboration with Alaska Sea Grant, the container was installed at the Kodiak Seafood and Marine Science Center. 96,000 ft of seedstring was seeded in mid October, and will be ready to outplant on regional Kodiak farms by Thanksgiving. Seed produced thus far is looking high quality with densely populated sporophytes and low contamination.

Status: 75% complete

Outputs: Containerized nursery deployed, commissioned, and operational. Nursery manager hired and trained. 96,000 ft of seedstring seeded and currently in production.





Clockwise from top left: Nursery being installed at the Kodiak Seafood and Marine Science Center; Allie Conrad at work in the nursery; seed spools ready for delivery; a production tank.

Overall Progress

The project is on track, with all major milestones through September 2025 completed or ahead of schedule. GreenWave has successfully convened Alaska's first statewide kelp nursery workshop, trained and networked operators, delivered infrastructure and equipment upgrades, and established a durable platform for ongoing peer learning and technical collaboration.

Next Steps (December 2025 – March 2026)

- Facilitate a post-season Community of Practice debrief call (January 2026).

- Prepare post-harvest evaluation to compare seed quality and yields (June 2026).
- Finalize infrastructure upgrades for remaining nurseries.

Conclusion

At midterm, the Kelp Seed Quality Improvement project has already met its primary short-term objectives: training operators, improving nursery operations, and establishing a vibrant peer network. These achievements lay the groundwork for consistent, high-quality kelp seed production across Alaska—advancing the state's mariculture sector toward long-term resilience and scalability. We are eager to see the results of this work reflected in statewide harvest numbers in 2026.