



Contractor Final Report

Alaska Mariculture Cluster Grant—Southeast Conference

Name of Project: Kelp Seed Quality Improvement

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Project Report

Purpose and Context

Alaska's regenerative ocean farming sector has grown quickly, but nearly every commercial kelp farm in the state depends on one of a small number of shared nurseries for its seed. For several seasons these nurseries have continuously run into two recurring problems: routine bouts of biological contamination on seed spools, and inconsistent sporophyte density that can lead to bare patches once seed is outplanted on farms. In 2024, Alaska farms averaged just 0.66 lbs of harvested kelp per foot of line, compared to 3.96 lbs/ft on comparable farms in Maine using the same growing method. Seed quality is largely determined at the nursery, before seed twine ever reaches the water, leading to unpredictable harvests no matter how well farmers manage their gear. Based on our experience with similar seed quality issues on the East Coast, GreenWave hypothesized that Alaska's harvest yields could be improved with investment in state-wide kelp seed cultivation protocols and training.

This project, funded through the Southeast Conference/Alaska Mariculture Cluster, set out to close that gap by standardizing nursery protocols, upgrading individual nursery infrastructure, introducing new seeding equipment, and—just as important—connecting Alaska's often-isolated nursery operators into a shared network for troubleshooting and peer learning. Our targets for the 2025 production season were for 100% of participating nurseries to supply high-quality spools to farmers, and a 20% increase in yield across Alaskan farms.

Activities and Outcomes

We organized the project into four linked tasks: a statewide workshop to precede the 2025 cultivation season, direct hands-on support to 2-3 selected Alaskan nurseries, the establishment of an active Community of Practice, and a pilot containerized nursery in Kodiak. All four tasks have been completed with details and results outlined below.

Task 1—Alaska Nursery Operators' Workshop

GreenWave, in partnership with Alaska Sea Grant, convened Alaska's first statewide kelp Nursery Operators Workshop, held August 12–14, 2025, in Cordova at the Prince William Sound Science Center (PWSSC). Eighteen participants representing eight active Alaskan nurseries attended, alongside two guest experts from the (then active) Atlantic Sea Farms nursery in Maine. A pre-workshop survey shaped the agenda around operators' real priorities, and GreenWave worked with a facilitation coach to design three days centered on comparing notes and digging into the details of three topics: nursery infrastructure, sorus prep and spore release, and routine operations. Each day began with peer knowledge-sharing (operators describing their own systems to the group) followed by group discussion on what has and has not worked, and ended with a hands-on demonstration of how GreenWave addresses this task as outlined in our protocols. Participants rated the workshop 4.9/5 for overall satisfaction and gave themselves a score of 4.25/5 for confidence heading into the season.

Status: complete.

Outputs: [customizable nursery SOP templates drafted and shared](#); [GreenWave's Kelp Nursery Operations Manual](#) published digitally.

Task 2—Support for Selected Nurseries

GreenWave staff interviewed every active kelp nursery in Alaska about their unique infrastructure challenges, then based on these conversations, purchased targeted equipment and supplies for efficiency upgrades at eight nurseries. GreenWave also partnered with C.A. Goudey & Associates to design and manufacture a custom seed spool winder, which was demonstrated at the workshop and deployed to seven nurseries statewide. On-site technical support went to three nurseries in fall of 2025—Prince William Sound Science Center, Alutiiq Pride Marine Institute (APMI), and Kodiak Ocean Growers—including help with water filtration installation, tank setup, spool winding, and spore release. At PWSSC, GreenWave staff helped seed over 34,000 ft of sugar kelp, which was outplanted at farmsites in Prince William Sound the first week of October, the earliest outplanting ever recorded in the region and the highest-quality seed the region has received.

Status: complete.

Task 3—Building a Community of Practice

At the close of the workshop last August, participants voted to start a shared WhatsApp channel, “AK Nursery Operators,” which grew to include every nursery operator in the state. Over the season, the channel has had more than a dozen regular contributors sharing photos, troubleshooting contamination, and trading advice in real time. Participants also asked GreenWave to produce a customizable Nursery SOP Template, along with a digital and printed version of GreenWave's own protocols (previously available only on the GreenWave Hub). GreenWave delivered the SOP template within two weeks of the workshop, and worked with

EdMaker to produce an updated SOP guide incorporating operator input, which we distributed digitally in October 2025, and in print at the Alaska Mariculture Conference and via mail in spring of 2026.

As planned, the group held a post-season Community of Practice debrief call in February 2026, and a final Post-Harvest Retrospective to compare statewide harvest yields to seed quality on August 6th, 2026.

Status: Complete.

Outputs: Active peer communication network established; SOP template and digital operations handbook distributed.

Task 4—Kodiak Pilot Project

GreenWave hired Allie Conrad as a Kodiak Nursery Manager last summer, and she completed intensive training at GreenWave's containerized nursery in Connecticut in July 2025. In August, working with Alaska Sea Grant, GreenWave staff installed a 40' containerized nursery—fabricated on the East Coast and shipped to Alaska—at the Kodiak Seafood and Marine Science Center. The nursery produced 96,000 ft of seedstring with dense sporophyte coverage and low contamination that was ready to outplant on regional Kodiak farms by Thanksgiving. GreenWave intends to operate the nursery again for the 2026-2027 season, and support a Kelp Nursery Training hosted by Alaska Sea Grant in fall of 2026. The containerized nursery design has gained notoriety across the state, and GreenWave is planning to build four additional units for distribution to two regions in Southeast Alaska by fall 2027.

Status: Complete/operational.

Statewide Results (2025/26 Season)

[Harvest data](#) collected recently through GreenWave's Kelp Climate Fund program show the investment paid off at the state level: statewide the weighted average of farmed kelp yield across all species rose from about 1.54 lbs/ft in the 2024/25 season to about 2.06 lbs/ft in 2025/26—an increase of 34%, well past our 20% target, and the highest median yield of any season based on our Kelp Climate Fund Records (since 2022-2023.) The weakest-performing farms this season also outperformed the weakest performers in every prior season, meaning fewer farms posted a genuinely bad harvest.

These gains varied by region. Kodiak saw the largest year-over-year improvements: where three farms roughly doubled to quintuple their per-foot yield between the 2024/25 and 2025/26 seasons, coinciding with the new containerized nursery and the hands-on support concentrated in that region. Cordova farms held roughly steady, with a slight increase in yields. And

Kachemak Bay farms, which had already been among the state's strongest performers in 2024/25, eased off slightly in 2025/26, though both remained above the statewide average.

Alaska Seed Quality Progress

2024

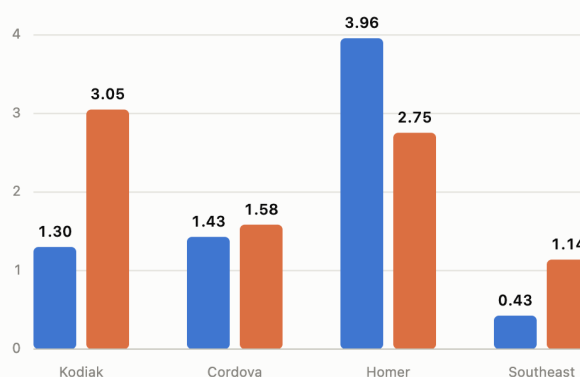


2025



Sugar kelp average yield by region

■ 2024-25 ■ 2025-26



Avg lb/ft is total lbs harvested ÷ total line harvested (weighted average) across all reporting farms in the region, sugar kelp only. Aggregated to region level only — no farm-level data shown.

Challenges and Lessons Learned

- Infrastructure upgrades paired with hands-on support and training drove the biggest gains. The largest jumps in yield happened in Kodiak, where new nursery infrastructure met direct, in-person technical support. That suggests pairing capital investment with coaching

time drives more reliable results than either alone—a useful data point for how we prioritize spending in future rounds.

- Seed quality is one input among several. In Cordova, seed quality was the best that farmers had ever seen, and seed was outplanted much earlier than previous years. However, the harvest data doesn't reflect a dramatic increase in regional yields. This could be due to regional environmental constraints (nutrient or light limitation,) or husbandry/farm design, or potentially even parental seed-stock. GreenWave is actively investigating this result with investment in a more streamlined nursery-led sorus collection effort in 2026.
- Low-cost peer learning delivered outsized results. The WhatsApp group and workshop cost far less than the infrastructure grants but produced fast, visible wins—PWSSC's earliest-ever outplant and highest-quality seed on record came directly out of workshop-week, hands-on support. Relationship-building and direct knowledge transfer can rival capital investment for near-term impact, and are worth keeping as a standing, low-cost part of future nursery-support work.

Next Steps

- Continue to support nurseries statewide who will be working with new infrastructure in the fall of 2026.
- Begin the replication process of containerized nurseries for other regions of Alaska (based on the unit deployed in Kodiak).
- Continue to invest in data collection and analysis around the unit economics of nursery production and the cost of seed.
- Continue to support the AK Nursery Operators WhatsApp channel as a standing, low-cost peer support network beyond the life of this grant.

Additional Information

This project's core bet was that Alaska's nursery operators didn't just need better equipment—they needed each other. The workshop and WhatsApp channel cost a fraction of the infrastructure investment, but the fastest, clearest win of the whole project came directly out of that peer exchange. We're grateful to Southeast Conference and the Alaska Mariculture Cluster for the chance to invest in both the equipment and the human network behind Alaska's kelp seed supply, and to every nursery operator who opened up their process to the group this year.

Data and Work Products

Work Products

- [GreenWave Kelp Nursery Operations Manual](#)—proven protocols and practices for seed cultivation, published digitally, last updated October 2025.
- [Nursery Operators Workshop photo album](#)—August 2025, Cordova, AK.

- [Nursery Operators Workshop videos](#)—demonstrations of sorus processing, spore release, and nursery operations.
- [Custom seed spool winder design](#)—developed with C.A. Goudey & Associates; seven units deployed to nurseries statewide.
- [Kodiak containerized nursery design](#)—Kodiak Seafood and Marine Science Center.
- [“Optimizing Kelp Seed Production” project update presentation](#)—Lindsay Olsen and Dave Bailey, February 27, 2026.

Data

- Statewide Alaska kelp yield data (lbs harvested per ft of line), by region, species, and season, [2024/25–2025/26 comparison](#) (slides 7-10).

Project Visibility and Outreach

- [Project update presentation to Southeast Conference/Alaska Mariculture Cluster, February 27, 2026, presented by Lindsay Olsen and Dave Bailey.](#)
- AK Nursery Operators WhatsApp community—ongoing peer-to-peer channel including every nursery operator in the state, with a dozen-plus regular contributors over the 2025 season.
- Alaska Nursery Operators Workshop, August 12–14, 2025, Cordova, AK—18 participants from eight Alaskan nurseries plus two guest presenters from Atlantic Sea Farms (Maine), hosted at the Prince William Sound Science Center in partnership with Alaska Sea Grant.
- GreenWave Newsletter feature story, [“The Future of Seed Production is Local - And Fits Inside a Box”](#), November 2025

Partner Organizations and Collaborators

- **Alaska Sea Grant**—co-planned and co-hosted the Nursery Operators Workshop; partnered on siting and installing the Kodiak containerized nursery.
- **Atlantic Sea Farms (Maine)**—sent two nursery experts, Thew Suskiewicz and Cara Blaine, to lead workshop demonstrations and peer exchange.
- **EdMaker**—educational consultant and facilitation coach; helped design the workshop curriculum and co-produced the Alaska Nursery Operators SOP Guide.
- **C.A. Goudey & Associates**—engineering partner; prototyped and manufactured the custom seed spool winder.
- **Prince William Sound Science Center (PWSSC)**—hosted the workshop and one of the three directly supported nurseries.
- **Alutiiq Pride Marine Institute (APMI)**—one of three directly supported nurseries.
- **Kodiak Ocean Growers Nursery**—one of three directly supported nurseries. Produced seed at cost for Kodiak farmers in fall of 2026.