***Exxon Valdez* Oil Spill Trustee Council**
Long-Term Research and Monitoring, Mariculture, Education and Outreach
Annual Project Reporting Form

For Instructions for each section below, see Reporting Policy, II (B); the Reporting Policy can be found on the website, https://evostc.state.ak.us/policies-procedures/reporting-procedures/

Project Number: 25220300

Project Title: Prince William Sound Kelp Mariculture Development for Habitat Restoration and Local Economy

Principal Investigator(s): Willow Hetrick-Price, Executive Director, Chugach Regional Resources Commission (CRRC)

Reporting Period: Feb 1, 2025 – January 31, 2026

Submission Date (Due March 1 immediately following the reporting period): 3/18/2026

Project Website: https://www.alutiiqprideak.org/kelp-farming

Please check all the boxes that apply to the current reporting period.

☒ **Project progress is on schedule.**

☐ **Project progress is delayed.**

☐ **Budget reallocation request.**

☒ **No-cost extension request.**

Carryover funds will be used over the next fiscal year to complete remaining project activities and ensure all deliverables are finalized without additional funding. This includes finishing data analysis and reporting, maintaining ongoing field monitoring and site operations to preserve multi-year datasets, and supporting continued refinement and closeout of hatchery and nursery infrastructure. Funds will also advance remaining research and protocol development work, finalize GIS tools and other project products, and sustain community engagement and workforce development efforts with Tribal and local partners as the project transitions to completion.

Specifically, the carryover will be directed toward:
Data Processing and Reporting
Finalizing analysis of water samples collected during the 2024–2025 growing season, completing synthesis of kelp tissue analysis results received in winter 2026, and uploading 2024–2025 and 2025–2026 datasets to the Axiom database in compliance with the EVOSTC data management

plan. Carryover will also support completion of the project's final data synthesis and final report due March 1, 2027.

Nursery and Infrastructure Improvements

Supporting continued use and refinement of the major water treatment and flow-through hatchery upgrades completed at APMI to improve biosecurity, production consistency, and labor efficiency, as well as closeout and transition activities associated with the Community Kelp Seed Nursery following completion of filtration upgrades in Fall 2025.

Field Monitoring and Site Operations

Continuing monitoring, sampling, and data collection for active research and commercial kelp sites, including Passage Island, Fox Farm Bay, Latouche Passage, Tatitlek Narrows, and remaining dropper line locations, while supporting site management, permit compliance, and continuity of multi-year datasets during project closeout.

Research and Protocol Development

Advancing kelp seed development research through gametophyte-based hatchery methods, direct-seeding trials, and associated laboratory and field work intended to improve seed consistency, reduce production costs, and strengthen the long-term economic feasibility of Alaska kelp farming.

GIS Tools, Community Resources, and Final Products

Completing GIS-based project tools, including continued development of the sorus collection map and other data-access resources for communities, and preparing final analytical products, recommendations, and summary materials that will be included in the project's final report.

Community Engagement and Workforce Development

Continuing outreach, on-water training, and workforce development with Tribal and local partners through farm monitoring, harvest support, educational events, and community-based mariculture participation so that the project's benefits continue to support locally rooted, Indigenous-led kelp mariculture development in the spill zone.

Will the requested budget adjustment change the original scope or objectives of the project?
☒*No* ☐*Yes*

Amount requested to carry over to the next fiscal year: $95,042

☒ **Personnel changes.**

In Fall 2025, CRRC's Board of Directors voted to terminate the subaward agreement with the project's subawardee, the Native Conservancy. The termination notice was issued in late September 2025 with a closeout date of October 25, 2025. As a result, project operations on the eastern side of Prince William Sound were paused during the transition, and Native Conservancy staffing support ended prior to the start of the 2025–2026 kelp growing season.

To maintain continuity and protect the integrity of multi-year monitoring datasets, CRRC initiated a closeout and transition process focused on (1) securing site management, liability coverage, and access arrangements for research leases; (2) ensuring data and reporting continuity for funder requirements; and (3) prioritizing local capacity so that monitoring opportunities and paid work can be carried out by Tribal members where feasible. During closeout, Native Conservancy indicated it would continue limited work on select eastern Prince William Sound research sites at its own cost through mid-2026 and would make monitoring data available to support reporting and project learning. CRRC is working to ensure the project remains community-centered and positioned for a smooth continuation of field monitoring and reporting moving forward.

Summary of Work Performed

Project milestone and task progress by fiscal year and quarter, beginning February 1, 2022. C = completed, D = delayed, X = planned or not completed. Fiscal Year Quarters: 1= Feb. 1-April 30; 2= May 1-July 31; 3= Aug. 1-Oct. 31; 4= Nov. 1-Jan 31.

Objective 1: Scale the infrastructure to increase the production capacity of the Alutiiq Pride Marine Institute and Community Kelp Seed Nurseries to meet projected kelp seed string demands of the region.

Milestone/Task	**FY22**				**FY23**				**FY24**				**FY25**				**FY26**			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Milestone: Produce Seed line			X	C			X	C			X	C			X	C				
Collect seed		X	C			X	C			X	C			X	C					
Operate nursery at full capacity		X	X	X		X	X	C		X	X	C		X	X	C				
Seed development research	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	C				
Milestone: Nurseries expanded to 7500sq ft & constant seawater filtration deployed																				
Build physical infrastructure APSH	X	X			X	C														
Install automatic seawater filtration for CKSN									X	X	D					C				
Milestone: Wild kelp forests mapped																				
Mapping wild kelp forests in region		X	C																	
Monitoring wild kelp forests						X	X	X	X	C	X	X	X	C	X	X	X	X		

Milestone: Lessons learned report																				
Produce report on methods of nursery development																X	X	X	X	
Deliverables																				
APSH scaled to 7500sq ft					C															
Field Data Collected & Made Available to the Public					X	C			X	C			X	C			X	X		
CKSN seed nursery scaled									C											
Systems improved													C							
New sori cultivation methods tested																C				
Nursery development report produced & shared																	X			
Creation of informational videos of sorus collection & seed development													X	X	X	X	X	X	X	

Objective 2: Develop effective, affordable, and sustainable practices for Native kelp farming through specific array designs, deployment methods, and seed cultivation strategies that will lead to the long-term restoration of oil-spill impacted areas of PWS.

	FY22				FY23				FY24				FY25				FY26			
Milestone/Task	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Milestone: Baseline data recorded at all sites	C				C				C				C							
Milestone: Ecosystem friendly designs tested and added																				
Test two new anchor types: 600-lb Danforth & 400-lb Dormors			X	C																
Expand and deploy grow lines (10 - 7200ft, 16-11200ft)		X	C			X	C			X	C			X	C					
Harvest & analyze kelp at test sites				X	C			X	C			X	C			X	X			
Launch a Bull-kelp only test site		X	X				X	X	X	C										
Site monitoring & data collection	X	C	X	X	X	C	X	X	X	C	X	X	X	C	X	X	X	X		
Deliverables																				
Annual test site data	X	X	X	X	C	X	X	X	C	X	X	X	C	X	X	X	X			

Public report on Analyses & data															X	X	X	X	X	
Creation of informational videos of restorative farming arrays, deployment, and harvest													X	X	X	X	X	X	X	

Objective 3: Conduct a comprehensive landscape analysis by deploying research kelp sites and kelp dropper lines to develop commercial farm capacity rating per region. Collect, analyze, and share data related to water quality, kelp tissue composition, sea life and other factors that may indicate the viability of a site for commercial kelp farms.

Milestone/Task	FY22				FY23				FY24				FY25				FY26			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Milestone: Promising commercial farm sites identified	C																			
Milestone: Single seeded dropper lines deployed in identified sites				C				C				C				C				
Milestone: Water quality and tissue sample data recorded at all sites, throughout grow season				X	X			X	C			X	C			X	X	X		
Site monitoring & data collection	X	X	X	X	X	C	X	X	X	C	X	X	X	C	X	X	X	X		
Deliverables																				
Annual test site data	X	X	X	X	C	X	X	X	C	X	X	X	C	X	X	X	X			
Public report on data, site ratings and recommendations															X	X	X			

Milestone/Task	FY22				FY23				FY24				FY25				FY26			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Annual reports					C				C				C				C			
Final report (due Mar 1, 2027)																				X

Throughout FY25, this project continued to serve as a central driver of kelp mariculture development in Southcentral Alaska, while remaining closely integrated with hatchery, research, and commercialization efforts occurring statewide. APMI's kelp hatchery systems implemented

significant water treatment and flow-through system upgrades to improve biosecurity, production consistency, and labor efficiency—advancements that align hatchery practices more closely with established East Coast and international seaweed production models. Seed string production supported research-focused test sites, dropper line deployments, and commercial farming operations across Prince William Sound, Lower Cook Inlet, Kachemak Bay, Southeast Alaska, and Cordova, underscoring APMI's role as a regional kelp seed production hub. Field monitoring, environmental sampling, and kelp tissue analysis will contribute to a growing multi-year dataset that informs site viability, species performance, and array design in oil spill–affected areas, while GIS-based data tools improved transparency and accessibility for communities and partners.

At the same time, activities during this reporting period unfolded within a broader statewide context in which seaweed production volumes and farmer participation remain constrained relative to buyer demand. In regions such as Cordova and Kodiak, interest from agricultural and bulk-product buyers has centered on procurement volumes in the tens of thousands of pounds—quantities that exceed the current aggregate production capacity of most individual farms and, in some cases, entire regions. These market realities underscore the importance of scaling coordinated production and establishing strategically located commercial sites capable of aggregating biomass to approach economies of scale. CRRC's commercial kelp site at Passage Island in Lower Cook Inlet represents a critical step toward this goal, serving not only as a production site, and the largest farm permitted in the Lower Cook Inlet region, but also as a workforce development platform that has engaged trained community farm monitors and operators from Port Graham and Nanwalek and the coastal community of Homer.

In addition to farming operations, CRRC's participation in the Kachemak Kelp Hub is helping to advance downstream market development through a kelp-based biostimulant product. This product pathway represents a strategically aligned market opportunity. The biostimulant market provides kelp farmers a comparatively high price point with a rapidly expanding agricultural market, while offering a relatively streamlined path to commercialization because processing methods are accessible and less time-, energy-, and capital-intensive that other stabilization approaches. The biostimulant initiative is designed to align production realities with market demand, positioning kelp in a value-added segment where price, scalability, and buyer interest intersect to create a viable and competitive opportunity for Alaska-grown product.

Through this EVOSTC-supported project and operations, CRRC has provided employment opportunities for local fishermen in Seward, Homer and Cordova, and Tribal members in Port Graham, Nanwalek, and Tatitlek with farm monitoring and seawater sample collection efforts. These opportunities represent a cumulative outcome of sustained outreach and relationship building with Tribal members and coastal community members since this project's inception. The trust and collaboration developed through this work have helped lay the groundwork for long-term community participation in mariculture. Additionally, the conceptualization and

beginning permitting efforts for a new commercial aquatic farm by the English Bay Corporation is a direct result of EVOSTC's investment in growing this emerging industry, which has propelled CRRC to expand its focus on developing kelp mariculture opportunities throughout the communities CRRC serves.

Objective 1: Scale the infrastructure to increase the production capacity of the Alutiiq Pride Marine Institute (APMI) and Community Kelp Seed Nurseries (CKSN) to meet projected kelp seed string demands of the region.

FY25 Deliverables: CRRC projected two deliverables to be completed during the FY25 reporting period:

- Field data collected and made available to the public.
    - Completed—data collected from the second growing season of this project, October 2023-June 2024, has been archived into the Axiom database in compliance with the EVOSTC data management plan. Data collected from the 2024-2025 growing season is in the process of being uploaded to Axiom database and is attached to this report in Appendix C; field data for the 2025-2026 growing season is in the process of being collected and is attached to this report in Appendix B.
    - As a part of an effort to make data collected under this project available, and accessible, to the public, APMI worked with a GIS mapping specialist to develop a user-friendly map that could easily share data collected under this project with community members. A link to the map with easily identified site locations and links to download data sets related to kelp growth and environmental monitoring data collected under this report is located here. This map has been shared during outreach events in communities, shared with Tribal Councils, and posted on CRRC's website.
- Systems Improved:
    - With support from GreenWave, CRRC and APMI facilities staff worked to transform the facility's kelp hatchery water treatment system to reduce contamination, increase biosecurity, and replicate the consistency and success East Coast hatcheries have enjoyed in kelp cultivation. This water treatment renovation included completely changing the plumbing and purification of seawater coming into the facility used for kelp cultivation. Previously, seawater feeding the kelp cultivation room was pumped from APMI's seawater intake to plumbing in the kelp module; from there, seawater was sterilized with three small sediment filters in line, ranging from 20, 5, to .5 microns, seawater was then passed through a UV sterilizer before being used to filled up aquaria. With assistance in design and purchase of materials from GreenWave, APMI's facility

now pumps seawater into three staged holding tanks, looping the water throughout various stages of disinfection, the first being the protein tank, where seawater is looped for 24-48 hours and exposed to ozone through a protein skimmer to kill bacteria; water is then transferred to a "polishing" tank, where it is looped through three, in-line sediment filters of decreasing sizes and a UV sterilizer for 24-48 hours; then transferred to a holding tank, where water temperatures are stabilized through the ambient air temperature and pass through an additional UV sterilizer before flowing into any kelp aquaria.

- A large part of this improved system involved not only upgrades to the water treatment coming into the kelp facility and temperature control, but also designing and plumbing APMI's tanks and aquaria to be set up on a flow-through design. This eliminates the need for time- and labor-intensive weekly tank changes by APMI staff and reduces potential contamination by minimizing the number of times kelp spools are handled by staff.
- Collectively, these improvements significantly enhanced the consistency and quality of seed string production, reduced staff time previously spent on tank cleaning and water changes and minimized handling of kelp spools—thereby lowering the risk of contamination and improving overall hatchery reliability.

- Install Automatic Seawater Filtration System at CKSN:
  - As noted in the FY24 Annual Report, this deliverable was rolled over to be completed in FY25. Native Conservancy did complete this deliverable in Fall 2025 prior to the CRRC and NC's contractual agreement being terminated. NC completed the upgrades to their hatchery facility during this reporting period, improving the filtration of their facility.

Milestones/Tasks Projected to be achieved in FY25:

- Produce seedline—APMI Kelp Hatchery Production Statistics in FY25:
  - A total of 59,600 linear feet (approximately 11 miles) of kelp seed string was grown at APMI's hatchery facility in FY25.
  - 8,800 linear feet of seed string was grown for research purposes at APMI's hatchery facility during the fall 2025 growing season:
    - 5,200 linear feet of seed string was grown for research sites at Fox Farm Bay, Latouche Passage, and Tatitlek Narrows. Species include bull kelp, ribbon kelp, sugar kelp, giant kelp, and three-ribbed kelp.
    - 3,600 linear feet of seed string was grown for a CRRC seed development project, in partnership with Woods Hole Oceanographic Institute, supporting the establishment of cost-effective, high-production seed string cultivation through gametophyte banking. This seed string was outplanted on a research farm in Kasitsna Bay, in January, with assistance and

partnership from NOAA staff, to compare growth rates of conventionally produced seed string with those of direct seeded growlines outplanted using gametophytes. This is the first step in trialing the use of gametophyte direct-seeding techniques that could allow commercial industry to move beyond the complex hatchery and outplanting logistics of using individual seed string spools, by maintaining gametophyte cultures of various kelp species. For more information, please see the Milestone "Seed Development Research," on page 6 of this report.

- 49,400 linear feet of seed string was grown for commercial purposes during the fall 2024 growing season:
  - 28,400 feet of seed string was grown for commercial farmers in Kachemak Bay, including sugar kelp, ribbon kelp, bull kelp, and three-ribbed kelp. This includes seed string grown for CRRC's commercial farmsite located on the south side of Passage Island.
  - 7,400 feet of ribbon kelp seed string was grown for a commercial farmer in Southeast Alaska.
  - 13,600 feet of sugar kelp seed string was grown for commercial kelp farmers in Cordova; this seed string was grown as a redundant measure and was not ultimately outplanted.
- APMI-grown seed string was also deployed at added dropper line locations, including Applegate Island and Eshamy Bay. The dropper line located at Copper Bay near Knight Island was not outplanted this year, due to the bay's tendency to ice over during winter, and therefore was deemed not a suitable location for kelp cultivation, despite being well-protected from inclement weather and located close to Chenega.
- APMI hatchery was fully scaled with various set ups suitable for both large- and small-scale cultivation. As noted in the FY24 Annual Report, the success of the flow-through system trialed in 2024-2025 growing season led to five large-scale, 90-gallon, flow-through tanks to be designed and utilized during the 2025-2026 growing season to support large-scale commercial farmers and production from Prince William Sound, Lower Cook Inlet, and Southeast Alaska. Smaller, 20-gallon aquaria, which APMI had used for the bulk of production in previous years, were used for small-scale kelp cultivation, particularly for research sites and kelp species such as three-ribbed kelp for which farmers requested only small amounts of seeded string.

- Collect seed:
  - APMI staff collected sorus tissue for five different kelp species: *Saccharina latissima* (sugar kelp), *Nereocystis luetkeana* (bull kelp), *Alaria marginata* (ribbon kelp), and *Cymathere triplicata* (three-ribbed kelp), and *Macrocystis pyrifera* (giant kelp).

- Sorus tissue for *S. latissima, C. triplicata,* and *Alaria marginata* was collected at Latouche Island for test sites and transported back to APMI for preparation and spore release.
- Sorus tissue for *N. luetkeana* and *A. marginata* was collected in Port Graham with the assistance of a Tribal member and local community farm monitor who has partnered with CRRC on site monitoring and outplanting efforts. Sorus tissue was transported back to APMI for preparation and spore release.
- Additional sorus tissue for *S. latissima* was collected in Jakolof Bay for CRRC's commercial kelp site at Passage Island and for its direct seeding project, partially funded through the BBBRC grant. This project focuses on seed development research to produce more consistent, reliable hatchery seed for kelp farmers. More information about this project can be found under the bullet "Seed development research."
- Sorus tissue for *M. pyrifera* was opportunistically collected in Latouche Passage after being found during a test site outplanting trip and transported back to APMI for preparation and spore release. Although the spore release for *M. pyrifera* was extremely prolific, no gametophytes ever developed after seed string was inoculated; the cause of this was not understood.
- Sorus tissue for *S. latissima* was collected in Windy Bay for use in GreenWave's Kelp Hatchery Workshop and transported back to APMI for spore release. More information about this project can be found under the Milestone "Seed Development Research."

- Operate nursery at full capacity:
  - Completed. The APMI hatchery facility was operated at full capacity during the 2025-2026 growing season.
- Seed development research: As noted in the FY24 Annual Report, APMI was awarded additional, supplemental funds through the Alaska Mariculture Cluster to develop a gametophyte-based hatchery that could reduce costly, time-intensive and seasonal sorus tissue collection trips and reduce contamination opportunities in the hatchery production phase. Through its gametophyte propagation project, APMI is optimizing culture and seeding protocols of *S. latissima*, expanding laboratory capacity for dedicated seed production, and testing both spool-based and direct-seeding approaches at field sites in Kachemak Bay. Gametophyte production is widely accepted in the kelp mariculture sector as the most promising method for consistent seed supply for scaling farm operations. The project integrates controlled laboratory experiments and outplanting trials to evaluate growth performance and density outcomes relative to traditional meiospore seeding. In parallel, APMI is cataloging genetic samples in coordination with the Alaska Department of Fish and Game to support genetic traceability and inform future permitting considerations. Together, this work is building the technical foundation, infrastructure,

and applied knowledge necessary to lower production costs, improve seed consistency, and strengthen the economic feasibility of Alaska's emerging kelp farming sector.

- CRRC also received funding through the Round 3 Equipment Grant through the Alaska Mariculture Cluster program to develop a commercial-scale gametophyte hatchery. This investment will strengthen the reliability and consistency of kelp seed production in Alaska by improving hatchery systems and increasing operational efficiency. By advancing controlled gametophyte propagation methods, the project will help reduce variability, lower production costs, and enhance the competitiveness of Alaska-grown seed, supporting the long-term economic viability of the state's mariculture industry.
- Additionally, APMI's Mariculture Director and hatchery manager participated in a statewide kelp hatchery workshop hosted by GreenWave in Cordova. The workshop convened representatives from all active kelp hatcheries in Alaska as part of a broader effort to standardize seed string production practices and strengthen technical coordination among hatchery operators throughout the state. APMI's engagement in this workshop directly supports its ongoing seed development research under this project by incorporating emerging and developing best practices in kelp hatchery operations, and contributing to a statewide community of hatchery operators focused on advancing efficient, high-quality kelp seed string in Alaska.

- Monitor wild kelp beds:
  - Wild kelp beds have been monitored opportunistically by CRRC's farm managers; information on location of kelp beds and timing of presence of sorus tissue has been shared with indigenous and local kelp farmers. A map of identified kelp beds, species, and timing of the presence of sorus tissue is in the process of being developed using collection and acquisition permits filed by CRRC with ADFG throughout the course of this project to identify past collection areas and dates of collection.
  - Due to data sovereignty concerns, this map will not be available for public viewing through CRRC's website; however, this map is still in the process of being developed to provide interested farmers from CRRC's communities with a visual guide of where and when to source fertile sorus tissue for commercial propagation purposes and will be included in the final report for this project submitted March 2027.

Objective 2: Develop effective, affordable, and sustainable practices for Native kelp farming through specific array designs, deployment methods, and seed cultivation strategies that will lead to the long-term restoration of oil-spill impacted areas of PWS.

FY25 Deliverables: CRRC projected one deliverable to be completed during the FY25 reporting period under this objective:

- Annual test site data: Completed, please see data uploaded into the EVOSTC-approved data management portal for the 2023-2024 growing season. Data collected from the 2024-2025 growing season is in the process of being uploaded to the Axiom database in compliance with the EVOSTC data management plan and can be found in Appendix C. Please see Appendix B for preliminary data for the 2025-2026 growing season.

Milestones/Tasks projected to be completed in FY25:

- Expand and deploy grow lines:
    - Completed. As noted in the "Summary of Work Performed Section," and with a view to the overall goal of this project to encourage the development of new economic opportunity throughout CRRC's coastal regions, CRRC has invested in scaling up operations at its commercial farm at Passage Island. Approximately 4,800 feet of seeded string was outplanted at CRRC's commercial site at Passage Island this year, with a goal of using the sugar kelp biomass produced to develop a market for a seaweed-based biostimulant and provide a direct avenue for wet kelp sales produced at this farm. More information on this project can be found in the "Summary of Work Performed" section on page 2 of this report, in the "Other Products" section on page 14 of this report, and in Appendix F. CRRC has maintained the expansion of its test sites from the previous growing season and has currently outplanted four, 100-foot growlines on its farm sites in Fox Farm and Latouche, growing sugar kelp, bull kelp, and three-ribbed kelp, and maintaining a blank line to identify opportunistic species and compare growth of wild kelp with that of kelp grown from hatchery-cultivated seed string.
- Harvest and analyze kelp at test sites:
    - The spring 2025 harvest season included multiple challenges for this project's team. Harvest was completed and data was collected at the commercial site at Passage Island and at each of the sites on the eastern side of the sound. No growth was observed at the test sites at Boulder Bay or Tatitlek Narrows, likely due to poor seed string outplanted on those locations, and late season outplantings in January, due to scheduling difficulties between crew availability and weather window opportunities. Harvest data was collected at each of the test site locations where possible—during the harvesting trip, the dropper line at Eshamy was not able to be located, possibly cut by another boater. No harvest data was recuperated at the site at Latouche Passage as well, due to growlines being enmeshed with anchor lines. For more information, please see the 24-25 Growth Report in Appendix D. Harvest data as available will be uploaded to the Axiom database in compliance with the EVOSTC data management plan.
- Site monitoring and data collection:
    - Completed. Please see the data attached to this report in Appendix B for preliminary site monitoring data collected for the 2025-2026 growing season. Please see Appendix C for data from the 2024-2025 growing season; these data

are in the process of being uploaded to the Axiom database in compliance with the EVOSTC data management plan.

Objective 3: Conduct a comprehensive landscape analysis by deploying research kelp sites and kelp dropper lines to develop commercial farm capacity rating per region. Collect, analyze, and share data related to water quality, kelp tissue composition, sea life and other factors that may indicate the viability of a site for commercial kelp farms.

FY25 Deliverables: CRRC projected one deliverable to be completed during the FY25 reporting period under this objective:

- Annual test site data: Completed. Data from the 2023-2024 growing season has been archived to the Axiom database in compliance with the EVOS data management plan; data from the 2024-2025 growing season is in the process of being uploaded to the Axiom database, while data collection from the 2025-2026 growing season is in progress.

Milestones/Tasks projected to be completed in FY25:

- Single-seeded dropper lines to be deployed in identified sites:
  - Completed. Single-seeded dropper lines were deployed at sites identified near Applegate Island and Eshamy Bay.
    - Other dropper lines permitted in northern Prince William Sound, including South Bay at Perry Island, Wells Bay, and East Squaw Bay, have not been utilized and will be closed with the end of this project. This project team was not able to locate consistent monitors to uphold the permits' monitoring requirements and as a result, dropper lines in north Prince William Sound were not expanded or deployed.
    - An updated map of currently operated sites under this project has been attached to this report in Appendix A.
- Water quality and tissue sample data recorded at all sites throughout grow-out season:
  - Completed. Water samples from the 24-25 growing season have been collected and are currently safely stored at APMI's facility in Seward. Samples will be analyzed this year and data will be uploaded to the Axiom database in compliance with the EVOS data management plan.
    - Kelp tissue samples from the 2024-2025 growing season were shared with Marine Biologics, which was awarded funds to support a kelp tissue processing project under the Research component of the Alaska Mariculture Cluster program. Tissue analysis from four different species of kelp, including bull kelp, sugar kelp, ribbon kelp, and three-ribbed kelp, was received from Marine Biologics in winter 2026 and is attached to this report in Appendix H. An analysis of these results from this statewide effort is in the process of being developed and will be provided in the final report on this project in March 2027.

- Site monitoring and data collection:
  - Completed. Data from the 2023-2024 growing season has been archived to the Axiom database in compliance with the EVOS data management plan; data from the 2024-2025 growing season is in the process of being uploaded to the Axiom database, while data collection from the 2025-2026 growing season is in progress.

2. Products:

Peer-reviewed publications:

None.

Reports:

During this reporting period, this project's manager contributed to a Pew Charitable Trusts report on the development of seaweed mariculture throughout Alaska; this report is currently under peer review and is expected to be published in 2026 and will be included in the final report of this project.

Popular articles:

None.

Conferences and workshops:

- **Kelp Night! in Port Graham**
  - In March, the project team hosted a community outreach event, "Kelp Night," at the Port Graham Community Hall to share information about kelp farming and value-added uses in the Chugach region. Approximately 12 community members attended to learn about mariculture development, kelp product opportunities, and ongoing research efforts, including the agricultural biostimulant project. The informal format allowed for open discussion about economic potential, local participation opportunities, and kelp applications, while also providing samples of kelp-based food products to increase familiarity and community engagement. This event supported the overarching goal of this project by building local awareness of kelp mariculture, fostering dialogue around kelp-based economic diversification, and strengthening relationships within an EVOS-affected community.
- **Kelp Pasta Workshop with Qutekcak Native Tribe:**
  - In December, this project's manager hosted a kelp-based luncheon in coordination with Qutekcak Native Tribe at the Tribe's office in Seward, AK. Sugar kelp grown on research sites under this project was used to make kelp pasta, which

attendees rolled out and made into a spaghetti dish topped with "seaweed-ish meatballs" donated to CRRC. The event provided an informal opportunity for the project manager to meet with Tribal members and share information about kelp mariculture operations supported by this project.

- **Passage Island Outplanting Tour with Port Graham Secondary Students and the Port Graham Corporation:**
    - This project's manager hosted an outreach event in Port Graham in coordination with the Port Graham Corporation, the Port Graham farm monitor assisting with the kelp farm operations at the Passage Island site, and secondary students at the Port Graham school. Students were brought out in three separate groups to the kelp site and were able to watch as the kelp farm was outplanted with bull kelp seed string, and assisted in obtaining site monitoring information, including learning how to use and read a refractometer for salinity measurements and how to use a secchi disk to assess turbidity. Students were also provided with kelp cookies made with kelp harvested from the Passage Island site in 2025. CRRC also hired a videographer to capture the outreach event and demonstration of outplanting operations. This project was created in direct response to feedback received from Port Graham community members who requested more youth-centered education events that could provide more information and opportunities to learn at the Passage Island site.
- **4th Annual Mariculture Conference of Alaska in Sitka, AK:**
    - The project team attended this statewide gathering of over 300 mariculture professionals including farmers, researchers, processors, regulatory agency personnel, and industry partners focused on advancing mariculture operations in Alaska. This event provided valuable opportunities to share project updates and build coalitions around shared goals for developing a healthy, equitable seaweed economy by connecting with potential collaborators, sharing insights on kelp product development, and exploring strategies for industry growth and knowledge exchange.
- **AMSEA Mariculture Operators Ergonomics Class:**
    - This project's manager coordinated with Executive Director of Alaska Marine Safety Education Alliance (AMSEA) to integrate staff from APMI's mariculture department into AMSEA's trainings on ergonomics. This workshop provided valuable knowledge that APMI staff can both integrate into its daily operations, and pass along to community members conducting field work related to this project, including sorus tissue collection, harvesting activities, and farm monitoring and sampling.
- **Farmer Knowledge Exchange Visit to Maine Aquaculture Sites:**
    - In October 2025, APMI's Director, APMI's Mariculture Director, and this project's manager all traveled to Maine with funding from Alaska Sea Grant's Farmer Knowledge Exchange Grant. This trip was coordinated with assistance

from Sebastian Belle, the President of both the Maine Aquaculture Association and National Aquaculture Association, and resulted in the visit to multiple aquaculture operations over the course of five days throughout the coast of Maine. This provided APMI staff an opportunity to network with kelp and seaweed producers in both the research and commercial sectors, at all stages of kelp production. APMI staff were able to discuss innovations in kelp seed research and cultivation strategies, view various hatchery setups, workflows, and equipment in use, as well as learn from value-added producers and marketers of kelp and seaweed products, including Maine Coast Sea Vegetables and Atlantic Sea Farms.

Public presentations:

- **Kenai Peninsula Economic Development District's Industry Overview Forum:**
  - This project's manager presented at the Kenai Peninsula Economic Development District's Industry Overview Forum to provide regional mariculture updates on the Build Back Better Regional Challenge Grant. Approximately 100 participants from various industries throughout the Kenai Peninsula were in attendance.
- **2nd Annual Indigenous Aquaculture Summit:**
  - This project's manager attended the second annual Indigenous Aquaculture Summit in Sequim, WA in Fall 2025 and shared a 30-minute presentation on CRRC and the Alutiiq Pride Marine Institute's kelp mariculture operations, focusing primarily on the work conducted under this project. The presentation included visuals of kelp seed grown at APMI, kelp seed string being outplanted at CRRC and APMI's test sites, and harvest yield information and visuals. Approximately 100 participants were in attendance.

Data and/or information products developed during the reporting period:

This year, the project manager worked with a GIS mapping specialist to develop a user-friendly map that could easily share data collected under this project with community members. The map was developed so that users could scroll around a map of the project area, click on the identified locations of CRRC's commercial and test kelp sites, and download data sets related to kelp growth and environmental monitoring of sites collected under this project. A link to the website can be found here.

As noted elsewhere in the report, CRRC is in the process of working to build a GIS map identifying the location and date of where viable sorus tissue has been found throughout the course of this project, using completion reports from the ADFG research permits and APMI's acquisition permits under this project. This map will be available to community members and will be included in the final report for this project.

Data sets and associated metadata:

Data for this project has been uploaded to the Axiom database in compliance with the EVOSTC data management plan.

Additional Products not listed above:

As noted in the FY24 Annual Report, CRRC has been awarded funds through the Alaska Mariculture Cluster program under a kelp processing feasibility study. Harvest trials demonstrated that while recirculating seawater systems can slow deterioration, kelp quality is generally limited to 2–3 days post-harvest. Approximately 3,000 pounds of ribbon, sugar, bull, and three-ribbed kelp were processed and frozen for further trials. Spray-drying trials conducted with an out-of-state tolling processor confirmed that powdered kelp can be produced, though formulation adjustments were required and recovery rates varied by species.

Raw product preparation infrastructure was not available at the beginning of this project, but findings indicate that while powdered kelp production is technically feasible, high freight costs, logistical complexity, and limited in-state processing infrastructure present significant economic challenges. Market volatility within the emerging US kelp sector further underscores the need for stable, Alaska-based stabilization and value-added processing capacity. CRRC is now prioritizing evaluation of in-state drying technologies, including infrared drying on the Kenai Peninsula, to reduce transportation costs and support development of a more resilient, regionally anchored kelp industry.

Kelp samples procured and dried at this facility under this ancillary project were sent to consumers and end users of kelp, mostly outside the state of Alaska. Three-ribbed kelp grown at CRRC's Passage Island site and processed at an Alaskan-based dryer were extremely well-received by an active buyer of kelp in California, who announced significant interest in procuring kelp for their operation for the spring 2026 harvest. Project updates under this project are available on the AMC website and the final report under this project will be shared in the final report in March 2027.

Additionally, kelp samples from this infrared dryer were sent to the management team at Maine Coast Sea Vegetables, following up on connections made during APMI's staff visit to Maine through funding available from SeaGrant under the Farmer Knowledge Exchange Grant. Maine Coast Sea Vegetables (MCSV) is a well-established seller of seaweeds and kelps on the East Coast and has been operating since the 1970s, through partnerships with independent, wild-stock collectors. Qualitative feedback received on the kelp produced was positive regarding texture of the product, but noted a strong acidic taste, inconsistent with seaweed products produced by MCSV. The wild-harvest collection structure differs greatly from Alaska's commercial mariculture operations and generates fewer operating costs for collectors versus farmers, thereby

lowering overall costs of production. Moreover, the climate on the East Coast allows for rapid drying using natural air or basic circulating fans, rather than the energy- and time-intensive costly drying resources that have been pursued under this processing project.

Lastly, in FY25, CRRC was awarded funds from the Alaska Mariculture Cluster program to develop an Alaska-produced liquid kelp biostimulant derived from farmed sugar kelp as a value-added market pathway to support economic development in EVOS-affected coastal communities. Commercial sugar kelp biomass from the Passage Island site during the 2024-2025 growing season supported the development of the biostimulant and field trials with agricultural partners in 2025. The field trial results highlighted the importance of research and testing on biostimulant products, but preliminary results demonstrated positive, consistent growth when applied at the proper concentration. Concurrent processing improvements, including equipment upgrades and fermentation refinements, are increasing production efficiency and scalability during the 2025-2026 growing season. Early-stage market testing and outreach to retailers and producers have identified both interest and adoption barriers, reinforcing the need for continued data generation and demonstration trials to support grower confidence. Collectively, this work strengthens the technical and commercial foundation necessary to position Alaska-grown kelp as a viable agricultural input and expanded market opportunity. An interim report for this project is attached to this report in Appendix F, and ongoing project updates and technical materials are available on the Alaska Mariculture Cluster website, as well as on this project's website, which can be found here.

3. Coordination and Collaboration:

The Alaska SeaLife Center or Prince William Sound Science Center

- In August 2025, APMI's Mariculture Director and Hatchery Production Manager attended a multi-day hatchery workshop in Cordova, facilitated by Greenwave, which connected all of Alaska's kelp hatchery operators. Throughout the fall 2025 growing season, APMI's production manager was in touch with hatchery operators throughout the state, including the Prince William Sound Science Center (PWSSC), notably to overlap in working with farmers throughout the southcentral region.
    - Due to constraints with ADFG's 50/50 rule, APMI was not able to cost-effectively procure its own sorus for outplanting on its research site at Tatitlek Narrows. This project's manager coordinated with the kelp production manager at PWSSC and postdoc fellow Angela Korabuk to obtain kelp seed string able to be outplanted at the test site in Tatitlek.
- In September 24th, 2025, CRRC's Education and Outreach Director gave a tour to Alaska SeaLife Center Board of Directors of the Alutiiq Pride Marine Institute facility. Participants were shown APMI's expansive kelp hatchery and walked through APMI's new water treatment and filtration system for its kelp production rooms.

- In October, 2025, this project's manager provided approximately 10 pounds of kelp from CRRC's test sites operated under this project, to a member of the Alaska SeaLife Center's Board of Directors. The project manager had been contacted by this individual requesting samples of kelp to conduct research and development tests on product development opportunities with kelp biomass.

EVOSTC Long-Term Research and Monitoring Projects

Project 25220201, Chugach Regional Ocean Monitoring Program: This project's manager presented at a Water Sampler Training workshop hosted by the Alutiiq Pride Marine Institute's Biology Lab Manager to provide updates on CRRC's kelp-related mariculture activities. Through that presentation, established a connection with a new potential kelp farm sampler located in Nanwalek who reached out to express interest in participating in CRRC's commercial kelp farm at Passage Island during the 2025-2026 growing season. Approximately 15 participants attended from CRRC's communities.

EVOSTC Mariculture Projects

Project 25220301, Social, Cultural, and Economic Assessment of Kelp Mariculture Opportunities for Coastal Villages Within the EVOS Spill Zone: This project's team continues to collaborate frequently with other participants involved in EVOSTC-funded Project 25220301. This project's project manager traveled to Port Graham and Nanwalek with researchers from University of Alaska Southeast under this project. Two separate outreach trips were made, the first at the end of April 2025, when the team flew into Port Graham for one night and anticipated flying into Nanwalek the following day to conduct interviews with several Tribal members and elders who had been selected through Tribal Council leadership. This trip was abbreviated due to extenuating circumstances involving a serious airplane crash in Nanwalek. While in Port Graham and awaiting alternative travel out of the community, this project's manager took these project partners out on a farm monitoring trip to the Passage Island kelp site with CRRC's community farm monitor. The project manager and the community farm monitor walked project partners through CRRC's data collection protocol and environmental monitoring efforts conducted under this project.

This project was rescheduled for Fall 2025, and in August 2025, the team traveled again to Port Graham and Nanwalek and project partners conducted several successful interviews with community members from both Port Graham and Nanwalek.

During this trip, this project's manager was also able to take advantage of the low tides to collect sorus tissue for this project to outplant at the commercial site at Passage Island. With UAS researchers and partners from Project 25220301, and a local Tribal member who assists with farm monitoring efforts out of Port Graham, this project's manager demonstrated sorus tissue

collection and packaging protocols for ribbon kelp (*Alaria marginata*) and bull kelp (*Nereocystis luetkeana*) to take back to APMI's hatchery for release.

In March 2025, this project's manager and APMI's Mariculture Director, Annette Jarosz, planned to travel to Juneau to meet in person with Dr. Michael Stekoll and tour UAF's kelp hatchery facility. The purpose of this trip arose from Project 25220301's annual meeting in Sitka, following the fourth annual Mariculture Conference of Alaska, where Dr. Stekoll shared about the importance of seaweed pressing to ensure accurate identification of seaweeds in his mapping component of this project. Due to budgeting constraints throughout the organization, the APMI team instead met virtually with Dr. Stekoll, who provided a list and links to materials needed for seaweed pressings and walked both through the protocol for collecting and pressing seaweeds and recording relevant information.

Project 25220302, Sustainable Mariculture Development for Restoration and Economic Benefit in the EVOS Spill Area: In January 2026, this project's manager participated in the EVOSTC-funded Mariculture ReCon annual meeting in Homer, where the liaison delivered a 15-minute project update highlighting recent progress and accomplishments. The presentation included the most recent harvest data and kelp seed string production numbers under this project, providing project members with a clear picture of operational outcomes and growth. The session also allowed time for questions and discussion, fostering dialogue and collaboration among project partners and EVOSTC representatives, and strengthening coordination between CRRC and the broader Mariculture ReCon network.

EVOSTC Education and Outreach Projects

Project 252220400, Community Organized Restoration and Learning: This project team has worked closely with CRRC's Education and Outreach team, funded under Project 252220400, to support coordinated communication efforts aligned with the CoRal Network. The project team has provided technical language, review, and feedback on social media posts and other public-facing materials that promote kelp mariculture and highlight its relevance to coastal communities.

Trustee or Management Agencies

This project's manager has maintained continued correspondence and connections to state and federal regulatory agencies relevant to this project. Aquatic research permits and their corresponding collection and completion reports have been submitted to Fish and Game to ensure compliance with kelp collection and outplanting procedures under this project.

Through a history of completion and collection reports submitted under this project, CRRC was able to add a layer to its GIS kelp site map to provide to community members the locations and

dates of when viable sorus tissue had been collected under this project. This information can be useful as a starting guide for new or potentially interested commercial kelp farmers in CRRC's communities who are looking to source fertile sorus tissue for cultivation. This map is in the process of being developed and will be included in the final report on this project.

In spring 2025, this project's manager worked extensively with representatives at the Department of Natural Resources to renew expiring land use permits for permit numbers LAS 33304, LAS 33306, and LAS 33308, for kelp test sites and dropper lines operated and outplanted this project. This required submitting new applications, maps, project descriptions, and insurance documentation for each of CRRC's six test sites throughout Prince William Sound, as well as the three dropper line sites on the western part of the Sound. The updated Land Use Permits have been attached to this report in Appendix G.

During this reporting period, CRRC has strengthened its connections to NOAA staff based in Homer and Kasitsna Bay. In Ocotober, 2025, this project manager provided NOAA staff with samples of its kelp agricultural biostimulant product for testing in staff's home hobby gardens. During a sorus tissue collection trip to Kasitsna Bay, this project team visited with NOAA's Homer-area team to share updates on progress related to this project, hopes for outreach and possible collaboration opportunities during the spring 2026 harvest, and research goals of NOAA staff.

Native and Local Communities

Quarterly status updates on this project were prepared and shared with CRRC's seven-person Board of Directors on March 25, 2025, June 23rd, 2025, September 16th, 2025, and December 18th, 2025.

Additional connections and outreach to native and local communities have been extensive and far-reaching under this project this year. A regular community farm monitor and sampler has been recruited at Port Graham for assistance with monitoring, outplanting, and harvest of CRRC's commercial kelp site at Passage Island; another community farm monitor and sampler has been recruited in the village of Tatitlek for monitoring of CRRC's test site there.

As noted above in the "Conferences and Workshops section," the project manager hosted two "kelp pasta" events, with kelp harvested from research sites operated under this project, in Port Graham and at Qutekcak Native Tribe in Seward. These events provided an opportunity for Tribal members to gather informally to think about new ways to use kelp and to provide a venue for open questions and conversations about kelp mariculture opportunities and activities.

Additionally, in October 2025, the project manager hosted a community-wide "outplanting" tour at CRRC's commercial kelp site at Passage Island, in conjunction with the Port Graham

Corporation and CRRC's community farm monitor in Port Graham. The tour consisted of students and community members; three separate trips were made out to the farmsite (to comply with passenger restrictions on vessels in use) and three separate demonstrations of the outplanting process were conducted; following a demonstration of the outplanting process, the project manager and Port Graham farm monitor pulled up alongside the tour vessel to demonstrate CRRC's environmental monitoring and water sampling protocol during bi-monthly monitoring visits. Seaweed cookies, made from kelp harvested off the Passage Island site in spring 2025, were provided to tour participants.

Through farm monitoring and environmental sampling opportunities, and outplanting and harvest support, community members have been provided hands-on workforce experience in kelp mariculture, while earning supplemental income connected to developing local industry. These positions have helped to familiarize local community members with mariculture operations. As new farm sites are permitted and production grows, these early employment and training opportunities will lay the groundwork for longer-term economic diversification and locally rooted mariculture enterprises within Chugach communities, which supports the overarching goal of this project to build an indigenous-led mariculture industry in Alaska. To that end, as noted elsewhere in this report, this project's manager has been working consistently with a representative from the English Bay Corporation to develop a kelp aquatic farm project that can be submitted during this year's aquatic farm application period. The goals of this farm will be to permit the farm in a location accessible by road from the community of Nanwalek, to allow for easier monitoring and access to the farmsite during inclement weather. Updates on this aquatic farm will be included in the final report on this project.

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4. Response to EVOSTC Review, Recommendations and Comments:

Previous reviewer comments received on Project 25220300 were omitted from this report, as comments at this point are several years old, but responses to reviewer comments can be provided by reaching out to this project's point of contact. Those comments can be found in the Biennial Review of FY22-FY23 Program and Projects, Report to the Trustee Council, Drafted October 7, 2024, and Updated February 4, 2025, as well as in the FY22 and FY23 Annual Reports for this project.

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5. Budget:

Budget Category:	Proposed FY 22	Proposed FY 23	Proposed FY 24	Proposed FY 25	Proposed FY 26	5-YR TOTAL PROPOSED	ACTUAL CUMULATIVE
Personnel	$343,695	$266,046	$361,095	$370,122	$379,375	$1,720,332	857,262.19
Travel	$17,452	$35,860	$17,452	$35,860	$17,452	$124,076	$77,158
Contractual	$23,925	$17,725	$17,725	$22,725	$18,925	$101,025	$90,219
Commodities	$21,150	$71,044	$17,050	$16,800	$19,900	$145,944	$139,471
Equipment	$150,000	$35,443	$0	$0	$40,000	$225,443	$159,439
Indirect Costs (report rate here)	$60,608	$59,617	$61,668	$66,470	$64,999	$313,362	$211,934
SUBTOTAL	$616,830	$485,735	$474,989	$511,977	$540,651	$2,630,182	$1,535,483
General Administration (9% of subtotal)	$55,515	$43,716	$42,749	$46,078	$48,659	$236,716	N/A
PROJECT TOTAL	**$672,345**	**$529,451**	**$517,738**	**$558,054**	**$589,310**	**$2,866,899**	
Other Resources (In-Kind Funds)	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	

INSTRUCTIONS: This summary page provides a five-year overview (FY 22-26) of proposed funding and actual cumulative spending which includes the **non-trustee agency** and **trustee agency workshsheets.** **This Summary Page should automatically populate as the formulas reference the cells in the non-trustee agency and trustee agency worksheets. Please make sure the totals given are correct.** The column titled 'Actual Cumulative' will be updated each fiscal year and included in the annual report (include information on the total amount actually spent for all completed years of the project). On the Project Annual Report Form, if any line item exceeds a 10% deviation from the originally-proposed amount; provide detail regarding the reason for the deviation.

Page 1