

TITLE?: Alaska Mariculture Comprehensive Plan

DRAFTING COMMITTEE VERSION 2018-01-07

Coverpage [CONTRACTOR]

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Message from the Governor [JULIE/HEATHER] Pg.1

Alaska's oceans are vitally important to the state. They provide food, jobs, transportation, and culture. Mariculture represents an opportunity to further develop the resources which come from these bountiful waters while maintaining Alaska's sustainable management practices adding to our renewable state resources. In 2016, I established the Alaska Mariculture Task Force (AMTF) through Administrative Order #280, with the directive to create a comprehensive plan for the development of a viable and sustainable mariculture industry producing shellfish and aquatic plants for the long-term benefit of Alaska's economy, environment, and communities. The AMTF represents a partnership between all stakeholders, including...(list of stakeholders from AO). I respect the long-term vision of the stakeholders who have been involved in this comprehensive planning process. Alaskans can accomplish big things when they collaborate, work toward a common vision, develop plans, and take actions to overcome challenges and incrementally reach their goals. I support this comprehensive plan as a result of this collaborative effort, and I commit to implementation of the portions that are relevant to the State in partnership with other stakeholders.

Message from the Alaska Mariculture Task Force [HEATHER] Pg. 2

Discussion of stakeholders involved, volunteer work, need for capacity building, etc.

Vision: *Develop a viable and sustainable mariculture industry producing shellfish and aquatic plants for the long-term benefit of Alaska's economy, environment and communities. (pg. 3)*

**Goal: *Grow a \$100 million mariculture industry in 20 years*
*(total annual output, in 2017 dollars)***

Guiding Principles of the Plan Pg. 4

- 1) **SCOPE**: For the purposes of this plan, mariculture is defined as enhancement of wild fisheries, aquatic farming, and restoration of invertebrates and aquatic plants. For this plan, the mariculture definition does not include salmon fishery enhancement. Also mariculture in Alaska does not include finfish farming, which is not legal in State waters.
- 2) **COORDINATION**: Implementation of this comprehensive plan requires coordination at every level to efficiently and effectively expedite development of the mariculture industry. For instance, local, state, federal and tribal governments, industry, communities, the University, and other interested stakeholders will ideally share development plans and activities and funding opportunities in an effort to avoid duplication and speed adoption of successful efforts. Coordination does not mean centralized decision making.
- 3) **LEADERSHIP**: Achievement of the vision and goal of this comprehensive plan will require the leadership of industry, coastal communities and other interested stakeholders. Leadership includes commitment of time and resources from those interested in developing mariculture.
- 4) **SUSTAINABILITY**: Mariculture development will be compatible with sustainability principles, and maintain and improve environmental integrity. The Alaska Constitution, and ADF&G management practices of sustained yield principles and the precautionary approach all require careful development of a blue economy which is environmentally friendly.
- 5) **ALASKA NATIVES**: Alaska Natives will benefit from mariculture development and will be involved in every element of the development process in order to ensure that outcome.
- 6) **INNOVATION**: Determination to overcome challenges and hurdles will require innovation. Alaska presents many unique challenges, and developers will look globally to applicable research and solutions to apply to Alaska's circumstances and geography without "reinventing the wheel".
- 7) **PROTECTION**: Implementation of this comprehensive plan will complement existing uses, such as subsistence, commercial fishing, and conservation. Protection of existing uses currently exists in state laws and regulations. Development will also create efficiencies with existing assets, infrastructure and expertise, for vessels, processing plants, products, and markets.

Elements of the Plan (pgs. 5-13)

1 - Support Alaska hatchery production to ensure industry (small/medium/large businesses) access to seed or juveniles [JULIE]

Shellfish and seaweed hatcheries are an integral piece of infrastructure required for any mariculture development. The importance of adequate support for the hatcheries at the early stages of development was identified as one of the top priorities by several of the Advisory Committees. Without adequate quality, quantity and consistency of seed or juvenile production, the mariculture industry will not thrive. In comparison to other regions, Alaska has additional requirements regarding the use of local broodstock and seed production in state (oysters being the only exception) in order to assure genetic concerns. These requirements are a part of ADF&G's precautionary principles that help to ensure the long-term sustainability of the resources, however, in the short-term, they add additional cost and constraints to seed and juvenile production.

- Support amendments to the Mariculture Revolving Loan Fund (HB 76) to allow shellfish and seaweed hatcheries to utilize the funds; increase the principle of the Fund as utilization increases with the development of the industry
- Support passage of enabling legislation for shellfish restoration, rehabilitation, and enhancement programs, which would increase demand and provide for additional revenue sources for hatcheries
- Support for operating cost subsidies in the short-term during developmental stages in order to bridge industry growth to a size which can sustain its hatchery infrastructure needs
- Develop additional long-term funding options available to support hatchery production (e.g. public/private partnerships such as the salmon enhancement program, seafood marketing or RSDAs, sport fish restoration funds, or others)
- Provide technical assistance and workforce development to existing and new hatcheries

2 - Establish an industry-driven, multi-stakeholder coordinating entity [JULIE]

In order to accelerate the development of the industry, coordination of multiple aspects of mariculture and across stakeholder groups is necessary. The past lack of coordination was identified as a systemic problem by several Advisory Committees (ACs). Consequently, the importance of creating an entity responsible for coordination was another element identified as one of the top priorities. The coordinating entity should be composed of a broad spectrum of

stakeholders, be industry-driven and be given a charge to coordinate all aspects of mariculture development in Alaska. At this time, it is unclear what the best approach is for selecting, staffing, and housing this entity. A number of models exist (i.e. AKCRRAB, MTF, ASGA, Board of Fisheries, etc.) with varying authority, capacity and scope related to coordination of mariculture development.

As an interim step, the Task Force recommends to extend the MTF for a defined period of time with a new directive to begin implementation of the comprehensive plan and work towards creation or designation of a long-term coordinating entity given proper capacity to complete its work.

3 - Implement identified research needs [PAULA]

Research is important to Alaska's developing mariculture industry and contributes to the state's economy by bringing new knowledge, processes, technology and ideas to a growing industry. Applied research seeks to solve practical problems using scientific study and the research process. Moving from research to application then requires support for scaling to industry levels. The Task Force's Research and Development Advisory Committee (R&D AC) identified an extensive and wide range of applied research that would move the Alaska mariculture industry forward, related to: shellfish farming, shellfish enhancement, seaweed mariculture; new species mariculture; environmental data collection and monitoring and economic data analysis. These priorities are listed in Appendix E.

The Task Force recommends that short, mid and long-term research priorities be adopted and that the short-term priorities identified by the R&D AC move toward implementation as resources allow.

The Task Force recognizes that applied research in mariculture is happening around the world and encourages the development of active partnerships and monitoring relevant progress for potential application in Alaska. The R&D AC identified research completed in Alaska to date (Appendix F). In doing this analysis, the R&D AC also identified a lack of coordination in addressing research priorities identified by industry in a timely manner. To address this systemic problem, a Mariculture Research Center (MRC) within the University of Alaska, with a director and an industry advisory body, is recommended, to build and coordinate capacity to address the research priorities identified in the plan to develop the mariculture industry. Alternately, a NOAA-funded Aquaculture Coordinator in the Alaska Region, similar to other regions could serve in this role.

Engaging industry and other stakeholders in applied research and transferring applied research to hatcheries and farmers to solve real-time industry problems is critical to the growth of the industry and to ensure the wise use of research dollars. The Task Force recommends that the

Aquaculture Specialist position within the UAF Alaska Sea Grant Marine Advisory Program, vacant since a retirement in 2015, be refilled as soon as possible. The position will be charged with supporting collaborative research with industry and technology application, and will serve as an Alaskan point of contact for National Sea Grant competitive funds directed toward mariculture development.

4 - Align laws, regulations and agency practices with stakeholder needs [SAM]

Alaska is a common property resource state and the Alaska Constitution includes provisions relating to common use and sustained yield. Most tide and submerged lands within Alaska's 40,000 miles of coastline are common property managed upon multiple use principals and sustained yield requirements. The Alaska Constitution requires resource decisions to be vetted through a public process and noticed for public input to balance resource management decisions with the best interests of the State of Alaska and consistent with sustained yield principles. The statewide program is jointly administered by three state agencies. The Department of Natural Resources (DNR) authorizes the use of tide and submerged land and seeks to balance use of the land for the development of aquatic farming with traditional uses of the area, upland owner access, public access, and navigation of public waters. The Alaska Department of Fish and Game (ADFG) issues permits for the operation of aquatic farms and hatcheries and acquisition and transport of stock and seed, ensures aquatic farming does not significantly affect existing uses of resources, and does not significantly affect fish, wildlife or their habitats in an adverse manner. The Department of Environmental Conservation (DEC) classifies growing areas, issues permits, conducts inspections, and monitors bacteria and toxins in shellfish harvest areas (growing waters) and shellfish products to protect human health.

At times, agency responsibilities to protect common property resources and human health have resulted in an atmosphere perceived as being in opposition to development of the mariculture industry. For growth to occur, it will be incumbent upon both industry and agencies to work together to promote the development of mariculture in a manner that is compatible with the prescribed responsibilities. This will include procuring enabling legislation, modification or drafting of regulations and policies, and leadership that provides direction to work towards finding ways to accommodate mariculture projects while still ensuring they provide for protection of common use, human health, and sustained yield of natural resources. Below are recommendations for high priority changes in this direction.

- Legislation to allow restoration, rehabilitation, and enhancement of shellfish stocks. (duplicative?)
 - Culturing of marine organisms for release into the wild to benefit common property wild capture fisheries is currently not authorized in Alaska, therefore the only legal form of mariculture in Alaska as of this writing is aquatic farming.

- Improve DNR farm site lease requirements, including bonding requirements, structure of lease fees, reduction of risk, and inclusion of best practices.

These are often the most challenging aspect of aquatic farming, especially new farmers not selling product yet. Adjustments through legislation or regulatory amendments to reduce the cost burden commensurate with farmer qualifications/circumstances would be beneficial.
- Build tribal and local outreach into farm site application process (duplicative?)

Opposition to new mariculture projects usually arises from a lack of information. Consulting with local tribes and communities during the application phase of a project should promote understanding and the utilization of local and traditional knowledge resulting in improved siting, configuration, and operation of farms.
- Legislation to amend Mariculture Revolving Loan Fund (duplicative?)

The Mariculture Revolving Loan Fund is challenging for many farmers and hatchery operators to use and is currently underutilized. Modifications such as allowing use by nonprofit hatcheries, alignment to work cohesively with FSA and other loan programs, and broader interpretation of adequate collateral would improve access to the loan program.
- Adequate financial support for state agencies to properly manage and timely process new or modified farm applications

Recent agency cuts due to the State's reduction in oil revenues have hampered agency responsiveness to farm applications and ability of staff to address developmental challenges. As the industry grows, agency staffing needs will increase, however, revenues paid to the state by industry will also increase. Adequate staffing during developmental stages is important to enable accelerated industry growth.

5 - Invest in mariculture expansion through new and existing sources, targeting growth from small, medium and large entities [ANGEL]

Securing adequate capital to support mariculture operations remains a challenge for many interested developers in Alaska. While a diverse framework of funding mechanisms exists in the form of various loan and grant programs, the eligibility requirements, terms, funding caps and general complexities have created barriers for new operators, resulting in underutilization of these programs. The extent of industry challenges in securing financing is further influenced by operational scale, species, uncertain risk and track record, access to collateral, the level of

understanding and awareness of various funding options and the limited scope of Alaska's young mariculture industry.

Existing operators have invested considerable private dollars and leveraged assets, assuming a relatively high level of personal exposure to support growth in the industry. While the MTF recognizes the need for continued private investment, the unique characteristics of mariculture operations, including the relatively long grow out periods of some species, learning curves associated with new operational techniques and the time needed to develop markets will necessitate the continued support and investment from public resources. Investment in the industry has already begun providing returns to Alaska, attracting recent meaningful interest from out-of-state investors and federal funding agencies. Continued private and public support will be critical in maintaining this momentum and helping the industry to grow and mature.

While Alaska's mariculture industry will require new investment in infrastructure, there are significant challenges and costs associated with development and operating that are unique to rural coastal Alaska and can be exacerbated for small scale operators, such as high transportation costs, limited workforce and minimal support services. Alaska's seafood processors have had to surpass these challenges and some have expressed interest in diversifying their operations through mariculture development, which could lend well to partnership opportunities. The Task Force recommends further coordination to inform existing infrastructure owners of potential business diversification opportunities and to foster relationships between mariculture and traditional seafood participants in the harvesting and processing sectors.

Attracting a diverse range of private investment within and outside of Alaska will be key for the industry to reach a scale where it can support viable hatcheries, nurseries and growers. This will likely mean additional small and large-scale development into the state. Protecting the existing and future participation of small and community scale mariculture operators is of critical importance to stakeholders. As the industry continues to grow, regulators, stakeholders and coastal communities should continue to engage in discussions regarding their vision for the industry and ways that small and large-scale developers can leverage resources, share information and access capital.

The Task Force has offered many recommendations, which are expanded upon in Appendix A, targeted at increasing access to capital and resources for existing and prospective participants in the mariculture industry. The list of short-term priority recommendations includes:

1. Support amendments to the Mariculture Revolving Loan Fund to allow shellfish and seaweed hatcheries to utilize the funds; increase the principle of the Fund as utilization increases with the development of the industry. (duplicative?)
2. Encourage private investment in mariculture from within Alaska and outside of Alaska

3. Coordinate and align existing federal and state funding sources for more efficient development of the industry
4. Explore the development of new funding sources and structures focused at providing assistance with business planning and start-up costs for both farming and enhancement
5. Explore partnerships to leverage utilization of existing coastal infrastructure
6. Develop an interactive web-based map tool, housed with the State, to help inform business planning, site selection and regulatory review

6 - Build public understanding and support for mariculture [HEATHER]

One of the key elements of developing mariculture in Alaska is building public understanding of, and support for, mariculture. No amount of public and private investment can result in project implementation and success without the support of the affected public and the subsequent political approval. Of particular importance is providing information that emphasizes public and private commitment to maintaining both environmental integrity and existing traditional resource uses.

Mariculture proponents must provide public outreach to multiple audiences to help assure realistic and positive views of mariculture development. This effort is a short and long-term need, recognizing and countering existing opposition to mariculture based on perceived environmental damage or genetic changes, concerns for aesthetics, market competition with wild-caught seafood, and conflict with existing users. Research into the potential for actual damage in these areas can form the basis for information to reassure concerned members of the affected communities and the wider public.

Inclusion of all stakeholders and community members, Alaska Native users and commercial fishing interests at the beginning of conversations about mariculture will go a long way toward allaying fears and concerns. The Task Force recommends identification of priority groups, and development of outreach and communication with each. Working with affected entities should be an integral part of the permitting process.

As developing and providing sources of important facts on an ongoing basis is an important element of mariculture development, it is crucial to identify the appropriate entities to gather and disseminate such information, and to provide advocacy for the growing industry. Some existing entities currently perform parts of these functions: the Alaska Sea Grant program with its extensive online library of mariculture information, the Alaska Fisheries Development Foundation (AFDF), the Alaska King Crab Research, Rehabilitation and Biology (AKCRRAB) program, the Alaska Shellfish Growers Association, the Pacific Shellfish Institute, and the Pacific Coast Shellfish Growers Association. In the future, coordination of advocacy and information functions should be integral to development plans.

The University of Alaska and the ANSEP program (duplicative?) should work toward expanding formal education in all aspects of mariculture – hatchery technology, research, business practices, product development and marketing.

Government agencies working with mariculture permitting and regulation should adopt an advocacy approach to the industry. For the benefit of the State and the country, regulators should seek to enable reasonable growth and development. In addition, information gathered by agencies related to the public health (i.e. water quality and PSP) should be made publicly available on a website managed by ADEC.

The Task Force encourages development of a GIS map tool to provide initial siting information to regulators and potential investors. A fact sheet could also be provided to help investors assess opportunities and develop business plans. (duplicative?)

Finally, the Public Education Advisory Committee agreed with the recommendation to encourage hiring of an Aquaculture Coordinator in the NMFS Alaska region, as well as an Alaska Sea Grant Mariculture Specialist. Progress is made by people with specific knowledge and focus, and leadership is required at both the national and State level. (duplicative?)

7 - Promote success in mariculture through Alaska Native participation **[JULIE/HEATHER]**

Mariculture development will benefit from the inclusion of Alaska Natives in every element of the development process, utilizing local and traditional knowledge in the siting of farms, accessing programs and funding sources geared towards economic and workforce development, and supporting appropriate development on Native owned lands. The Task Force recommends the following actions in order to ensure that Alaska Natives will benefit from mariculture development and will be involved in every element of the development process:

- Outreach to Alaska Native organizations related to mariculture opportunities and relevant technical and financial support (i.e. Intertribal Agriculture Council).
- Build tribal and local outreach during farm lease application process; intended to avoid conflict and increase rate of success for new farm apps (duplicative?)
- Development of collaborative workforce development programs between tribes, industry and other relevant partners (duplicative?)
- Integration of mariculture topics and studies in the Alaska Native Science and Engineering Program (ANSEP) (duplicative?)

8 - Develop and enhance the mariculture workforce (existing and future farmers, hatchery and scientific workforce) [PAULA]

Direct employment at mariculture operations in Alaska includes owners, partners, employees, interns and family members. Paid positions can include part time, full-time, seasonal and year round. Most operations include volunteers, family members or interns to help keep labor costs down. Hatchery and nursery operations generally use paid full-time and seasonal employees. Challenges to the shellfish/seaweed farming workforce, identified by the Mariculture Task Force include: remote and often isolated farm locations, intense work condensed into a small season, physically demanding and repetitive work, outdoor work in all weather, potentially low wages if an employee and/or small business owner responsibilities.

Targeting key populations such as Alaskans used to weather conditions, veterans, fishermen, and rural youth is one strategy to meet workforce needs. Incentives and workforce development programs should be developed to encourage more Alaskans to follow this career pathway.

Mariculture farmers in Alaska are not required to have any particular certification or training to operate their businesses. Hatchery workers often have some level of post-secondary education, although that requirement is not consistent in Alaska. However, training and professional development is a critical part of recruiting a quality workforce and ensuring self-employed farmers gain the most value from their businesses.

The Mariculture Task Force identified three objectives for workforce development in the mariculture industry:

1. Increase profits and business success for those already in the industry;
2. Ensure hatcheries and nurseries and farms have a skilled workforce to draw from;
3. Inform, recruit and retain new entries into the industry.

Currently there is virtually no dedicated capacity in Alaska for developing the shellfish/seaweed farming workforce. For many years, Alaska Sea Grant's Marine Advisory Aquaculture Specialist, a UAF faculty member, worked with the shellfish farming industry on training, permitting, researching best growout practices and market opportunities. That faculty salary was repurposed by UAF since retirement in 2015, and remains vacant. Refilling that position would enable the Specialist to be a catalyst for workforce development including: fine-tuning and updating training materials, developing and coordinating training opportunities. The Task Force recommends that the Aquaculture (Mariculture) Specialist be refilled and continue to be part of Alaska Sea Grant's Marine Advisory faculty due to Sea Grant's connections with industry, the ability to help direct industry-driven research and to transfer research results for development.

Other short-term recommendations from the Task Force include:

- 1) Develop mariculture skill-building resources and provide professional development to growers, available remotely and in-person
- 2) Offer an intensive, hands-on “Introduction to Shellfish/Seaweed Farming” boot camp.

Longer term, the Task Force recommends:

- 1) Development of a mariculture apprenticeship/mentorship program
- 2) Participation in industry career awareness/career exposure activities
- 3) Evaluation and tracking participant progress and including mariculture workforce impacts in economic and employment analyses.

9 - Develop new mariculture markets and products [HEATHER]

As mariculture of shellfish and aquatic plants grows in Alaska, marketing research and development, as well as product development, will help assure that increased production results in increased opportunity and stable revenue for the industry and the State.

Wild-caught seafood produced in Alaska is marketed by individual processing and distribution companies, and in a species-based program through the Alaska Seafood Marketing Institute (ASMI). Processors pay ASMI a self-imposed tax for each pound of seafood production, and the State and the Federal government contribute funding as well. The revenues are used for domestic and foreign food service and retail marketing campaigns.

If Alaska mariculture-produced shellfish and aquatic plants are to benefit from the world-class ASMI marketing program, producers will need to contribute to ASMI funding through self-imposed contributions. ASMI will be encouraged to revise its strategic plan and advertising taglines to include mariculture products, shifting “wild” messaging to the more inclusive “Alaska Grown” or “Alaska Pure.”

Part of the effort should be in increased collaboration between ASMI and the existing Alaska Grown program, creating a synergy with a larger group of Alaska Food Producers.

In developing the public’s awareness and acceptance of mariculture products, public education and marketing intersect. Public information about mariculture’s economic and environmental benefits helps create a positive perception of a wide range of mariculture products. In turn, mariculture product marketing should include general education about mariculture at every level, similar to the current inclusion of sustainability in wild seafood marketing.

Marketing of mariculture opportunities to the seafood industry itself will be an important part of development. Proponents should plan to inform existing processing plant owners of the potential for diversification into mariculture products.

Research and development of new product forms and new market opportunities will also be needed. A dedicated Alaska Sea Grant Aquaculture Specialist, as well as Federal focus and funding for mariculture will contribute to these efforts. The RandD section of this report details work that needs to be done:

For oysters, research and develop value added products aimed at export markets; for mussels, develop frozen product form and other value added products and methods to compete in the world market; for sugar and ribbon kelp, develop international markets and product stabilization.

In addition, the developing industry has a great need for economic data collection and research, to help determine the financial viability of shellfish and aquatic plant operations (see the RandD section).

Appendix A – Background of the establishment of the Alaska Mariculture Task Force and the development of the comprehensive plan; AO#280; composition of MTF, ACs, table of meetings [CONTRACTOR] **MOVE AHEAD OF ELEMENTS?**

Appendix B – Administrative Order #280

Appendix C – Summary of the findings of the *Economic Analysis to Inform the Alaska Mariculture Initiative – Phase 1 – Case Studies* (Northern Economics) [CONTRACTOR]

Appendix D - Summary of the findings of the *Economic Analysis to Inform a Comprehensive Plan - Phase 2 – Economic Framework* (McDowell Group) [CONTRACTOR]

Appendix E – AMTF Advisory Committee Recommendations [AC Chairs - complete final lists]

Appendix F – List of Research that has been completed to date [R&D AC – complete final]

Appendix G – References [CONTRACTOR]

Appendix H – Definitions [CONTRACTOR]