

Alaska Mariculture Development Plan
DRAFTING COMMITTEE VERSION 2018-02-11

Cover page [Naomi - APICDA]

Inside cover page:

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Message from the Governor

The potential for increased and sustained economic development from mariculture of shellfish and aquatic plants in coastal communities is significant. Alaska has over 30,000 miles of coastline with clean, pristine, nutrient-rich water. The waters off Alaska produce over 50 percent of the seafood of the United States, and our state is a leader in sustainability principles related to its responsible management of these resources.

Shellfish and aquatic plants have historically been crucial to the subsistence and livelihoods of many Alaskans. Mariculture offers the potential to provide resiliency to shellfish resources facing future environmental threats. Mariculture represents an opportunity to further develop the renewable resources that come from these bountiful waters while maintaining Alaska's sustainable management practices. Industry and policymakers acknowledge the importance of determining what is needed to fully develop this potential into a reality.

In 2016, I established the Alaska Mariculture Task Force (MTF or Task Force) 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 MTF represents a partnership among a broad spectrum of stakeholders. I respect the long-term vision of the Task Force participants 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 reach their goals.

I support this comprehensive plan, and commit the State of Alaska to work in partnership with stakeholders and agencies toward implementation of the plan.

(Removed and provided to Barbara Blake for Governor's review as a separate letter/proclamation)

Message from the Alaska Mariculture Task Force

The members of the Alaska Mariculture Task Force (Task Force) deeply appreciate Governor Walker's leadership in support of mariculture development, and the support of his administration in the formulation of this plan. The diverse membership, listed below, reflects a true cross section of mariculture interests and experience, broadened further by the incorporation of effective and involved Advisory Committees on each major element. The Task Force believes that this work has resulted in a realistic plan that recognizes the ideal conditions in Alaska for mariculture development, identifies the challenges ahead, and recommends strategies and solutions to achieve the State's full potential.

Alaska has all the qualities of an ideal environment for mariculture development: clean and abundant waters, hardy citizens with maritime experience, and an existing seafood industry and infrastructure. The state has research and development capacity at the University and industry level, as well as a sophisticated seafood marketing organization that effectively reaches consumers all over the nation and the world. The regulatory process and agencies are accessible, and the Legislature is on the verge of passing essential laws to help fund mariculture and allow expanded hatchery shellfish production.

Along with these strengths come challenges. This plan identifies these challenges and barriers to development in the areas of investment, regulations, research and development, coordination and leadership, workforce needs, marketing and public education. The Task Force then makes detailed recommendations regarding the changes and additions needed to achieve the full potential of Alaska's opportunities. The top priority recommendations are presented in the body of the plan and the broader lists of recommendations are included as appendices. The Task Force recognizes that over time priorities will change. Long-term challenges such as ocean acidification, climate change, sea otter population growth, and invasive species, will require more comprehensive future strategies.

We believe that mariculture development will bolster the economy of our state, in particular the coastal communities where much of the seafood infrastructure and experience already exist. This economic development will be environmentally sound, and designed to complement rather than replace existing uses. The plan is intended to increase profitability for those already engaged in mariculture, to expand participation, and to provide coordination to refine regulations, access funding and conduct needed research.

The recommended improvements and new solutions will require commitment, and an implementation plan. The Task Force members remain committed, and are enthusiastic about moving forward Alaska's mariculture industry.

MTF – provide org logos to Julie for this page.

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Paula Cullenberg, Alaska Sea Grant (ASG)
Julie Decker, Alaska Fisheries Development Foundation (AFDF)
Angel Drobnica, Aleutian Pribilof Island Community Development Association (APICDA)
Jeff Hetrick, Alutiiq Pride Shellfish Hatchery (APSH)
Heather McCarty, Central Bering Sea Fishermen's Association (CBSFA)
Mike Navarre / Chris Hladick, Alaska Department of Commerce, Community and Economic
Development (ADCCED)
Sam Rabung, Alaska Department of Fish and Game (ADFG)
Dr. Michael Stekoll, University of Alaska Southeast & University of Alaska Fairbanks (UofA)
Kate Sullivan, Southeast Alaska Regional Dive Fisheries Association (SARDFA)
Christopher Whitehead, Sitka Tribe of Alaska (STA)
Eric Wyatt, Alaska Shellfish Growers Association (ASGA)

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)*

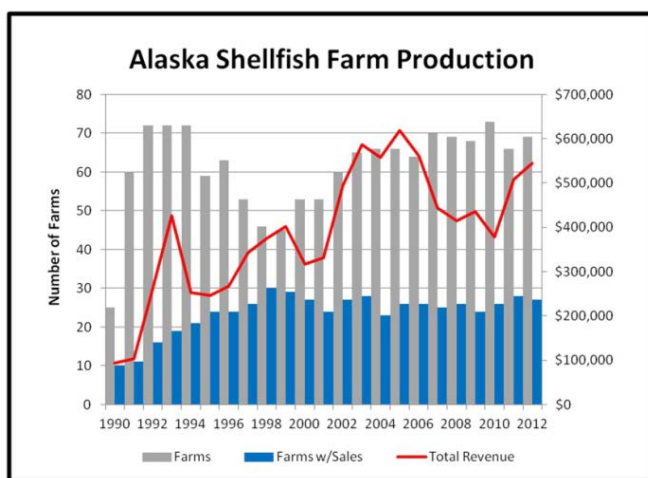
Guiding Principles of the Plan

- 1) **SCOPE:** For the purpose of this plan, mariculture is defined as enhancement, restoration, and farming of shellfish and seaweeds. Finfish farming is not legal in Alaska waters.
- 2) **COORDINATION & LEADERSHIP:** Effective implementation of this comprehensive plan requires coordination and commitment of time and resources from local, state, federal and tribal governments, industry, communities, the University, and other interested stakeholders.
- 3) **SUSTAINABILITY:** Development of mariculture will be compatible with sustainability principles to maintain and improve environmental integrity, as required by the Alaska Constitution and ADF&G management practices.
- 4) **ALASKA NATIVE PARTICIPATION:** Mariculture development will benefit from the involvement of Alaska Natives in every element of the process.
- 5) **INNOVATION:** Alaska presents many unique challenges, and developers will look globally to applicable research and solutions to apply to Alaska's circumstances and geography.
- 6) **COMPATABILITY:** Implementation of this plan must protect existing marine uses, such as subsistence, commercial fishing, and recreation. It will also utilize Alaska assets and infrastructure.

Executive Summary

Introduction

In 1988, the Aquatic Farm Act (Alaska Statutes 16.40.100-199) was passed by the Alaska Legislature. Since that time, several attempts have been made to develop the mariculture industry. Yet, the industry's annual production remains at approximately \$1 million.



During this same period, other regions of the world have seen tremendous growth in the areas of shellfish and seaweed mariculture. This presents a significant opportunity for growth in Alaska's seafood production. The combination of this opportunity and other current events, such as the state budget gap, ocean acidification, climate change and otter predation, has inspired stakeholders to take a

fresh look at the development of mariculture utilizing a more comprehensive approach.

In 2014, AFDF received a grant from the National Oceanic and Atmospheric Administration (NOAA) for AFDF's **Alaska Mariculture Initiative** – an effort to accelerate the development of mariculture in Alaska with the vision to grow a \$1 billion industry in 30 years. As a result of the Initiative, Governor Walker established the **Alaska Mariculture Task Force** (Task Force or MTF) in 2016 by [Administrative Order #280](#). AO#280 details the benefits to Alaskans which could be provided by a fully developed mariculture industry:

- Economic – providing jobs and commerce in coastal communities;
- Environmental – improving the local ecosystem in various ways, such as providing habitat improvement, carbon removal, or countering ocean acidification;
- Cultural – compatible with traditions, cultures, and skills in rural communities;
- Industrial – complements and expands our existing renewable seafood industry, which is Alaska's largest private sector employer;
- Food Security – increases access to local foods for Alaskans.

The Task Force is comprised of 11 representatives of various stakeholders, including communities, tribes, industry, hatcheries, the University, and two state departments (Commerce, Fish and Game). The Task Force was directed by the Governor to create a

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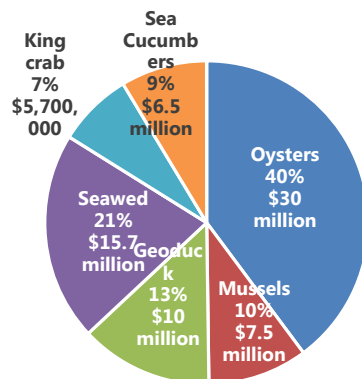
comprehensive plan for the development of a viable and sustainable mariculture industry producing shellfish and aquatic plants for the long-term benefit of Alaska’s economy, environment and communities. This document is a result of that comprehensive planning process by the MTF.

A part of the comprehensive planning process has included dozens of public meetings of not only the Task Force, but also five additional Advisory Committees in the following topic areas: Investment and Infrastructure, Research and Development, Regulatory Issues, Public Education and Marketing, and Workforce Development. All information related to meetings of the Task Force is available at the [Task Force’s website](#).

Another part of the planning process included a phased economic analysis to inform the development of the comprehensive plan. The [first phase of the economic analysis involved a set of case studies](#) of other regions with successful mariculture industries and relevance to Alaska in terms of species, regulatory structure, etc. These case studies found six key elements for successful mariculture development, which included: 1) pre-existing seafood industry infrastructure, 2) public acceptance and support, 3) favorable growing areas, 4) development plan with coordinated research and development strategy, 5) successful business plans and growing technology, 6) workforce development (see Appendix D).

The [second phase of the economic analysis provided an economic framework](#) for the development of a \$100 million mariculture industry in 20 years (total annual output, without adjustment for inflation). This framework included the following six species currently under some level of research and development in Alaska and annual revenue goals in 20 years: oysters (\$30M), geoducks (\$10M), seaweeds (\$15.7M), mussels (\$7.5M), sea cucumbers (\$6.5M), and King crab (\$5.7M). 30-Year output associated with goals in this economic framework is projected at \$274 million, while 50-Year output totals \$571 million (see Appendix E).

Twenty-Year Annual Revenue Goals



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Pairing mariculture development with existing seafood industry infrastructure and expertise (e.g. vessels, processing plants, workforce, seafood markets, and hatcheries) is also likely to provide a successful platform from which to grow and expand the mariculture industry in Alaska. Additionally, small farms in Alaska have struggled for the past 30 years to provide the economies of scale necessary to pay for and support the shellfish hatchery infrastructure required. The addition of more participants, some of which are larger-scale, will help support and stabilize the shellfish hatcheries and provide for other synergies and efficiencies to the benefit of smaller-scale participants as well.

A healthy and fully developed mariculture industry is likely to include small, medium and large farm sizes, and may also include a variety of business models for the interaction of participants and specialization of work related to the industry. One of the key findings of the "[Alaska Shellfish Farm Size Feasibility Study](#)", published by the Alaska Department of Commerce in 2015, showed that larger farm sizes would result in better economic feasibility of farm businesses: "Regardless of farm type, larger farm size scenarios demonstrated better short and long term profitability than smaller farm sizes...new entrants into the Alaska shellfish farming industry should consider investments in medium and large scale farms," (pg. 2).

Alaska has a number of successful examples of resource development for the benefit of Alaskans from which to draw for guiding mariculture development. Alaska's salmon industry is a great example of how small, medium and large-scale participants have developed beneficial working relationships in order to harvest, process, develop new products, market and sell hundreds of millions of pounds of Alaska salmon every year. Alaska's salmon fishery enhancement program is another example of a successful integration of sustainable resource management practices for the long-term benefit of public and private interests.

A Plan for Action

The MTF determined the following to be the priority recommendations for implementation of this comprehensive plan.

Priority Recommendations

- 1) Secure seed supply through hatcheries
- 2) Pass State legislation to 1) help fund hatcheries through the Mariculture Revolving Loan Fund, and 2) allow shellfish enhancement
- 3) Establish an Alaska Mariculture Development Council
- 4) Fill key positions to enable the growth of the industry: NOAA Aquaculture Coordinator in Alaska; Alaska Sea Grant Mariculture Specialist and Mariculture Research Center Director at University of Alaska
- 5) Designate a single point of contact to assist applicants with state and federal permitting in state waters
- 6) Invest to accomplish these top five priorities

MTF – are these the correct priorities?

A) Secure seed supply through hatcheries

Shellfish and seaweed hatcheries are an integral piece of infrastructure required for any mariculture development. Several of the Task Force Advisory Committees identified adequate support at the early stages of development as one of the top priorities. Hatcheries can be independent entities that serve a variety of customers, such as small and medium-sized farms, and fishery enhancement or restoration programs. Hatcheries can also be vertically integrated within larger farm businesses. However, new farm entrants are most likely to limit their initial risks by purchasing seed from an existing hatchery. 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 in order to address genetic concerns (oysters being the only exception). 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.

It is in the public's interest to support the development of the industry through short-term financial support of hatcheries with the eventual goal of self-sufficiency. This can be accomplished by aligning state, federal or private resources.

The MTF recommends the following actions:

- Amend the Mariculture Revolving Loan Fund to allow and encourage shellfish and seaweed hatcheries to utilize the fund; increase the principle of the Fund as utilization increases with the development of the industry
- Support funding for hatchery operating costs in the short term until the industry grows to a size that is self-sustaining. Develop additional long-term funding options available to support hatchery production (e.g. public/private partnerships, such as the models for the salmon enhancement program, seafood marketing or regional seafood development associations (RSDAs), sport fish restoration funds, or AIDEA partnerships)
- Provide technical assistance to existing and new hatcheries. As ocean conditions change, hatcheries play a role in monitoring these changes and can help identify suitable adaptations. Technical assistance will allow hatchery staff to adjust hatchery procedures quickly to overcome continually changing circumstances.

B - Establish an Alaska Mariculture Development Council

In order to accelerate the development of the industry, coordination is necessary across stakeholder groups and multiple elements of mariculture. Several MTF Advisory Committees (ACs) identified lack of coordination as a systemic problem. The Task Force agreed, and considers creating an entity responsible for coordination 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, including coordination with recommended future key personnel (i.e. NOAA Aquaculture Coordinator in Alaska, Alaska Sea Grant Mariculture Specialist, and Mariculture Research Center Director).

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, ASMI, etc.) with varying authority, capacity and scope.

As an interim step, the Task Force recommends:

- Extension of the MTF and its ACs for three years with a new directive to begin implementation of the comprehensive plan and to work towards creation or designation of a long-term coordinating entity given proper capacity to complete its work.

C – Maximize Innovation and Value through Research

Research can solve practical problems and contribute new knowledge, processes, technology and ideas to Alaska’s growing mariculture industry. Partnering with farmers, hatcheries and other stakeholders in innovation and applied research is critical to the growth of the industry and to ensure the wise use of research dollars. Application of research results then requires demonstration to scale up to industry levels. The Task Force recommends supporting collaborative research with industry and technology application.

The Task Force’s Research and Development Advisory Committee identified an extensive list of applied research that would move the Alaska mariculture industry forward. The Task Force endorses the short, mid and long-term priorities described in **Chapter X**.

Applied research in mariculture is happening around the world and the MTF encourages the development of active partnerships and monitoring relevant progress for potential application in Alaska. However, Alaska does not yet have the capacity to coordinate, direct and engage industry in research priorities effectively and has limited capacity to share and demonstrate applied research results. The Advisory Committee recognized this as a systemic barrier to development of the industry.

Therefore, the Task Force recommendations include:

- Establish a Mariculture Research Center within the University of Alaska to coordinate and develop partnerships to address research priorities and continually update.
- Fill the Alaska Sea Grant Mariculture Specialist position within UAF to ensure engagement with, and application of research to, mariculture businesses.

D - Align laws, regulations and agency practices with stakeholder needs

Most tidelands and submerged lands within Alaska’s coastline are common property and are managed using multiple use principles and sustained yield requirements. The Alaska Constitution requires resource decisions to be vetted through a public process to balance resource management decisions with the best interests of the people of the State of Alaska, and remain consistent with sustained yield principles.

The statewide program is jointly administered by three state agencies. The Alaska Department of Natural Resources (ADNR) authorizes the use of tideland 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, acquisition and transport of stock and seed, and ensures aquatic farming does not significantly affect existing uses of resources, or fish, wildlife or their habitats in an adverse manner. The Alaska Department of Environmental Conservation (ADEC) is the Alaska Shellfish Sanitation Authority (ADEC) with regard to protecting human health while allowing for commercial sales of shellfish. As such, ADEC must demonstrate that it meets all requirements of the National Shellfish Sanitation Program (NSSP) in order to maintain its membership in the Interstate Shellfish Sanitation Conference (ISSC). The US Food and Drug Administration (FDA) evaluates Alaska's program, determining Alaska's conformance with national standards for harvest water quality, marine biotoxin controls, physical plant sanitation, harvest and handling practices, and control of harvest (patrol and enforcement). Alaska's commercial industry can ship outside of Alaska only if Alaska demonstrates conformance with the national sanitation program as required by the U.S. Food and Drug Administration (FDA).

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 enacting recommended legislation, modification of some regulations and policies, and leadership that provides direction towards accommodating mariculture projects while still ensuring protection of common use, human health, and sustained yield of natural resources. In addition, current agency staffing levels are unlikely to absorb additional workload at the pace that a fast growing industry demands. However, this growth will contribute to the economy and provide revenue to the state to support these needs.

The Task Force recommendations for high priority changes in this direction are:

- **Designate a single point of contact to assist applicants with state and federal permitting in state waters.** A wide array of permits is required, each with individual permitting processes that an applicant for a mariculture farm or project must navigate. Most agencies do not know what permitting is required by other agencies and it is not within their legal purview to assist with those. Applicants will benefit from a single point of contact for all permit applications and instructions, as well as assistance in navigating the diverse permitting processes. **The point of contact could be housed within ADCCED-**

Division of Economic Development, Alaska Sea Grant, or ADNR-Division of Agriculture.
[needs MTF discussion]

- **Enact legislation to allow restoration, rehabilitation, and enhancement of shellfish stocks.** These activities are recurrently not authorized in Alaska, therefore the only legal form of mariculture at this time is aquatic farming. [MTF – should this be a separate section under legislative action?]
- **Modify 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.
- **Provide the resources necessary to ADEC to maintain access to commercial markets for Alaska shellfish and protect human health.** In order for industry to sell molluscan shellfish, ADEC must meet NSSP requirements, provide biotoxin and water quality testing services, and address public health challenges such as *Vibrio parahaemolyticus* (*Vp*). Limited staff capacity and funding currently prevent ADEC from implementing these federal requirements and effectively advocating for Alaska's unique attributes which require federal regulatory exemptions. Additionally, very little research has been conducted in Alaska to monitor for *Vp* and biotoxins to verify that controls remain effective in preventing illness.

E – Secure and promote Investment in mariculture

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. Further challenges in securing financing are 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.

At this early stage, mariculture is a relatively high-risk investment due to 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. While the MTF recognizes the need for continued and increased private investment, the developing industry needs the continued support and investment from public resources. Previous investment in the industry has started providing returns to Alaska, attracting interest from private investors and federal funding agencies.

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 overcome 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.

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.

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, medium and large-scale development in 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.

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.

The Task Force recommendations in Chapter A target increasing access to capital and resources for existing and prospective participants in the mariculture industry.

The list of priority recommendations includes:

- Increase the principal of the Mariculture Revolving Loan Fund as utilization increases with the development of the industry.
- Encourage private investment in mariculture

- Coordinate and align existing federal and state funding sources for more efficient development of the industry
- 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
- Explore partnerships to leverage utilization of existing coastal infrastructure
- Develop an interactive web-based map tool, housed with the State, to help inform business planning, site selection and regulatory review
- Provide adequate financial support for state agencies to properly manage and timely process new or modified farm applications

F - Build public understanding and support for mariculture

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 and producers should 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 addressing existing negative attitudes about mariculture. These concerns include 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 youth, 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, the Pacific Coast Shellfish Growers Association, Kachemak Shellfish Mariculture Association, ADF&G, NOAA and Alaska Pacific University. In the future, coordination of advocacy and information functions should be integral to development plans.

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.

Task Force recommendations include:

- Provide public outreach to multiple audiences to promote mariculture development
- Prepare and emphasize information about maintaining existing uses, preserving the environment, preventing genetic issues and avoiding market competition with wild-caught seafood
- Identify and communicate with all community stakeholders early in the process
- Coordinate information and advocacy through a central coordinating body

G - Promote success in mariculture through Alaska Native participation

Mariculture development will benefit from the participation of Alaska Natives in every element of the 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:

- Provide outreach to Alaska Native organizations related to mariculture opportunities and relevant technical and financial support.
- Seek tribal engagement through local outreach during the farm permitting process to increase success for new farms
- Establish collaborative workforce development programs between tribes, Alaska Native Corporations, industry and other relevant partners
- Integrate mariculture topics and studies in relevant educational programs

H - Grow and develop the mariculture workforce

Self-employed owners and family members currently make up the bulk of the workforce at mariculture farms in Alaska. Hatchery and nursery operations generally employ full-time and/or seasonal employees. Farmers and hatchery operators identify workforce needs as an ongoing challenge.

Impediments to meeting workforce needs include: remote farm locations, short seasons, physically demanding and repetitive work, outdoor work in inclement weather, and relatively low wages. Targeting key populations of Alaskans habituated to weather and remote conditions, such as fishermen, tribal members, veterans and rural youth is one strategy to meet workforce needs. Incentives and workforce development programs may encourage more Alaskans to follow this career pathway.

Training and professional development is critical to recruiting a quality workforce and ensuring self-employed farmers gain the most value from their businesses. However, no required certification or degree is needed to operate a mariculture farm in Alaska. Hatchery workers may have some level of post-secondary education, although that requirement is not consistent across the state. Thus, the best training and professional development is often via short-courses available onsite or via distance delivery, focusing on operational and business needs of Alaska mariculture farms and hatcheries.

Task Force recommendations to support the mariculture workforce include:

- Develop mariculture skill-building resources and provide professional development opportunities to growers, available both remotely and in-person.
- Offer an intensive, hands-on “Introduction to Shellfish/Seaweed Farming” boot camp in partnership with industry, tribes, educators and other stakeholders.
- Utilize the University of Alaska’s Sea Grant Mariculture Specialist position (currently vacant) to implement these recommendations. Develop a mariculture apprenticeship/mentorship program.
- Participate in industry career awareness activities.
- Evaluate and track participant progress and include mariculture workforce impacts in economic and employment analyses.

I - Develop new mariculture markets and products

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 governments have contributed 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. If mariculture producers become part of the ASMI funding stream, ASMI could 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.

Research and development of new product forms and new market opportunities will also be needed, as detailed by the Research and Development Advisory Committee (See **Chapter X**). A dedicated Alaska Sea Grant Mariculture Specialist, as well as Federal focus and funding for mariculture will contribute to these efforts.

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. New products for either frozen or dried products may make additional farm sites economically feasible due to lower cost of transportation and other factors

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, as described in the Research and Development section.

Task Force recommendations include:

- Coordinate mariculture marketing efforts through trade associations and consider joining with ASMI through self- assessment
- Encourage ASMI to expand marketing range to include mariculture products
- Engage in product form research and development and market research
- Support economic data collection and research

Appendix A – Administrative Order #280

Appendix B – Table Listing Dates of Meetings of the MTF, Advisory Committees (ACs) and Public Outreach

Appendix C – AMTF AC Members, Guidance to ACs, and Recommendations from ACs

Appendix D – Executive Summary of the findings of the *Economic Analysis to Inform the Alaska Mariculture Initiative – Phase 1 – Case Studies*, by Northern Economics

Appendix E – Executive Summary of the findings of the *Economic Analysis to Inform a Comprehensive Plan - Phase 2 – Economic Framework*, by McDowell Group

Appendix F – List of Research that has been completed to date

MTF – need to check accuracy of the above appendices included in packet.

MTF – need relevant photos for final edited version.