

An underwater photograph of a kelp forest. The water is a deep blue-green color, and sunlight filters through from the surface, creating a dappled light effect. The kelp plants are tall and thin, with long, dark green blades that sway in the water. The overall scene is serene and natural.

Mariculture Development



Mariculture Development: Making Progress

*Presented to:
Southeast Conference
February 13, 2018*

*Presented by:
Julie Decker & Mark Scheer, AFDF*

MADE IN ALASKA
MARICULTURE

ALASKA DIVISION of
ECONOMIC DEVELOPMENT

ALASKA
GROWTH TO OPPORTUNITY

ALASKA
DEPARTMENT OF
COMMERCE,
COMMUNITY,
AND ECONOMIC
DEVELOPMENT



AFDF

A glowing, translucent crab with a yellowish-orange body and spiky legs, set against a dark background. The crab is illuminated from below, creating a bright glow around its body and legs. The background is dark with some faint, scattered light spots.

What is **Mariculture**?

In Alaska, mariculture is...



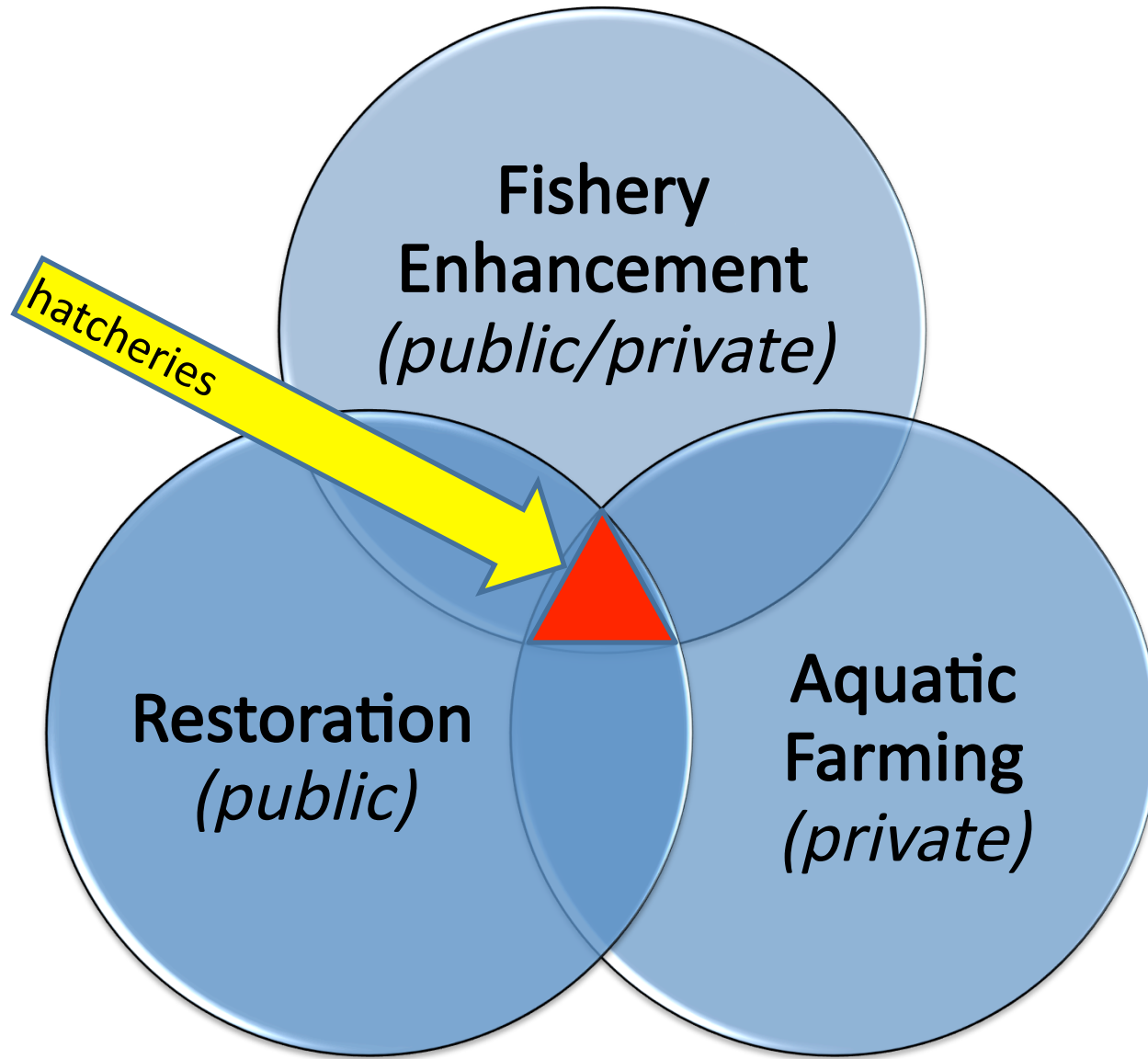
Finfish Farming

In Alaska, mariculture is...

*Species = local (shellfish + invertebrates + aquatic plants)
+ Pacific oysters*



Mariculture is...



Alaska Mariculture Task Force

[Administrative Order #280](#): Governor Walker established the Alaska Mariculture Task Force (AMTF) by AO #280 in 2016.

Directive - “To develop a comprehensive plan for a viable and sustainable mariculture industry producing shellfish and aquatic plants for the long-term benefit of Alaska’s economy, environment and communities.”

Due – March 1, 2018

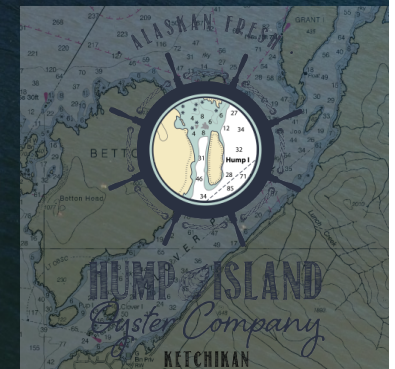
Why - Benefits to Alaskans



Benefits to Alaskans: Economic



*Hump Island Oyster Co.
Wins 2016 Entrepreneur of the Year from
Ketchikan Chamber of Commerce*





Benefits to Alaskans:

Cultural

Connects Alaskans
with traditional
food sources,
harvesting
activities & skills

Benefits to Alaskans:

Food Security

Increases access to
local foods



Salmon hatchery – Prince William Sound

Commercial fishing vessels – Bristol Bay



Processing plant – Kodiak



Benefits to Alaskans: **Industrial**

- Compliments & expands existing \$6 billion seafood industry
- Builds on assets – vessels, plants, sustainable fisheries, salmon hatcheries, Alaska seafood brand & ASMI

Ocean Acidification in Alaska

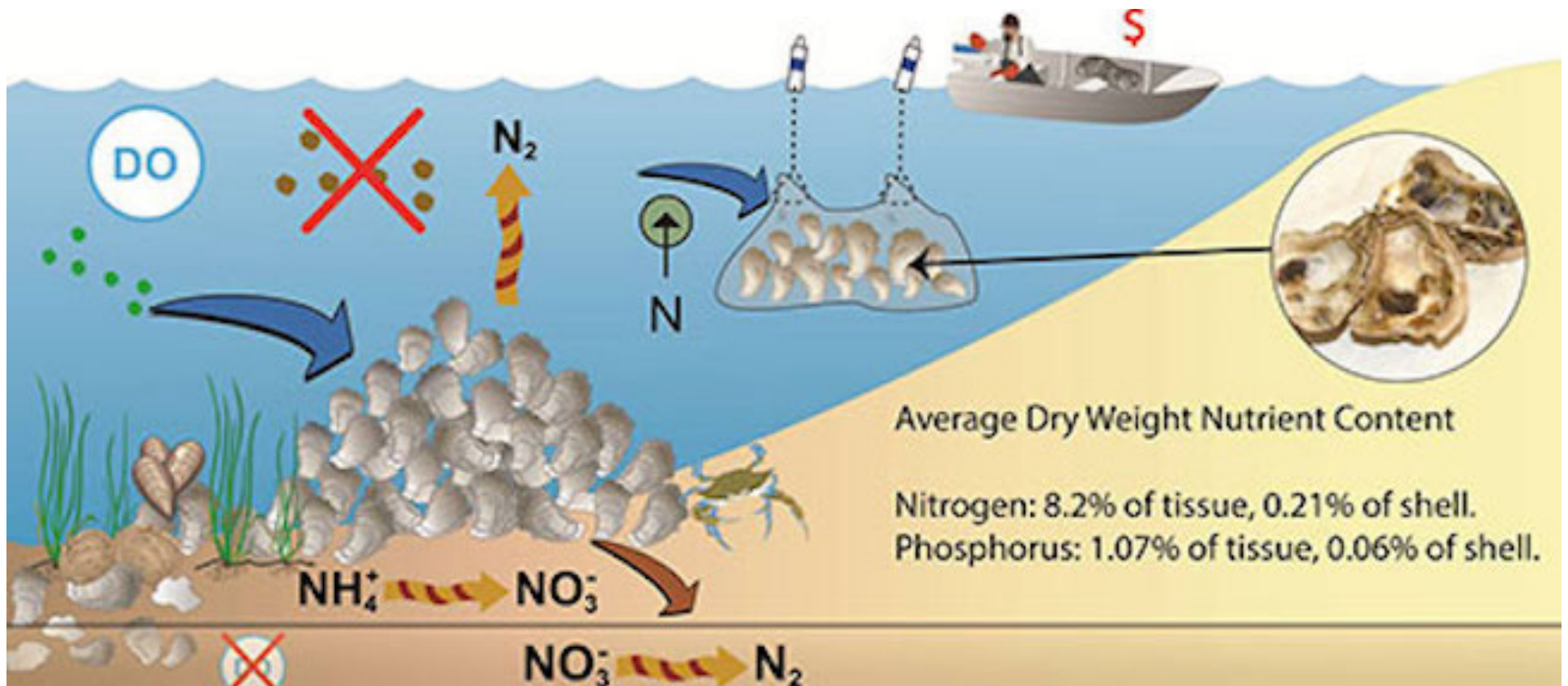
Learn about it. Discuss it. Build support for State action.



Photo by Shalita Busch

Benefits to Alaskans: Environmental

Potential climate change mitigation & habitat improvements through ecosystem services (ie. water filtration, carbon, nitrogen & phosphorus removal)



Mariculture Task Force:

Comprehensive planning process

- ✓ Mariculture Task Force (11 members)
- ✓ 5 Advisory Committees (15+)
- ✓ Nearly two years long
- ✓ Included iterative economic analyses
- ✓ Includes dozens of recommendations, in eight categories
- ✓ Includes six priority recommendations
- ✓ Goal – Grow a \$100 million industry in 20 years



The screenshot shows the website for the Alaska Governor's Mariculture Task Force. The header includes the State of Alaska logo and the Alaska Department of Fish and Game. The page title is "Alaska Governor's Mariculture Task Force Overview". There are navigation tabs for "Overview", "Task Force Members", "Task Force Meetings Information", "Advisory Committees", and "Reference Library". The "Overview" tab is selected. The main content area contains a mission statement: "To provide recommendations to develop a viable and sustainable mariculture industry producing shellfish and aquatic plants for the long term benefit of Alaska's economy, environmental, and communities". Below this is a paragraph explaining the task force's creation by Governor Walker in 2016, its purpose to boost the mariculture industry, and details about its members and advisory committees. To the right of the text is a photograph of several white plastic crates filled with Pacific oysters. Below the photo is the caption "Pacific oysters ready for Alaskan market." There is a "Sign Up To Receive Messages" section with an email input field and a "Subscribe" button. At the bottom right, there are social media sharing icons for Facebook (Like), a question mark, and a green "Share" button. The footer of the page displays "Alaska Governor's Mariculture Task Force" and "Overview".

Economic Analysis – Phase 1: Case Studies

- ✓ Seaweed in Ireland
- ✓ Clams in Florida
- ✓ Geoducks in Washington
- ✓ King Crab in Alaska
- ✓ Salmon Enhancement in Alaska
- ✓ Mussels in Spain
- ✓ Mussels in Prince Edward Island
- ✓ Mussels in New Zealand

[View copy here](#)

Funded by:



**Economic Analysis
to Inform the Alaska
Mariculture Initiative:
Phase 1 Case Studies**

Prepared for
**Alaska Fisheries
Development
Foundation**

March 2015



In association with
Pacific Shellfish Institute

Maine Shellfish Research and Development

This publication was prepared with funds from Award #NA14NMF4270058 from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce. The statements, findings, conclusions and recommendations are those of the authors and do not necessarily reflect the views of NOAA or the Department of Commerce.

August 2017

Alaska Mariculture Initiative Economic Analysis to Inform a Comprehensive Plan

PHASE II

Prepared for
Alaska Mariculture
Task Force



Prepared by
McDowell
GROUP

Economic Analysis – Phase 2: Economic Framework in Alaska

- ✓ Existing industry in AK
- ✓ Opportunities & Challenges
- ✓ Economic Model for Growth
- ✓ Strategic Development Goals

***GOAL - \$100 million
industry in 20 years***

[View copy here](#)

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MTF Advisory Committee Recommendations

Alaska Mariculture Task Force
Summary of Advisory Committee Recommendations
12/2/2017 - includes re-numbered elements

| Advisory Committee | # | Other Info | Name of Recommendation | Summary | AC Priority | Elements | Priorities | Timeline (Years) | Responsible Entity |
|--------------------|------|------------|---|--|-------------|----------|------------|------------------|--------------------|
| Regulatory Issues | 1 | ADFG | new legislation to allow shellfish enhancement | restoration, rehabilitation & enhancement are not currently legal | 1 | 1, 4 | | | |
| Regulatory Issues | 2 | ADFG | amend reg to allow importation of seed | amend 5 AAC 61.0701 to allow importation of seed from Alaska broodstock; currently allowed for only oyster & W. scallop | 2 | 1 | | | |
| Regulatory Issues | 3-A | ADFG | adopt reg clarifying possible exceptions to genetics policy | if write stock & spawes that do not reproduce do not need to be subject to genetics policy | 2 | 1, 4 | | | |
| Regulatory Issues | 3-B | ADFG | adopt reg to require timeline for genetic stock structure data | when a lack of data for a species exists, require a timeline for data collection in order to reduce precautionary restrictions | 2 | 3, 4 | | | |
| Regulatory Issues | 4 | ADFG | amend statute & reg to remove "initial" | stock acquisition is limited to only initial needs, however, hatcheries may need more than just initial stocks | 3 | 4 | | | |
| Regulatory Issues | 5 | ADFG | avoid excessive details in applications | adhere to actual language in statute/reg for info requests in applications | 1 | 4 | | | |
| Regulatory Issues | 6-A | DNR | amend reg to allow reduced initial lease fees | allow for deferring portion of fee, or graduated increase, until farm is under full production | | | | | |
| Regulatory Issues | 6-B | DNR | reduce bond amounts with training/experience (low risk) | consider farmers with de reduced bond amount | | | | | |
| Regulatory Issues | 6-C | DNR | adopt industry best practices | increase near farmer acc pool could reduce individ DNR ability to clean-up at | | | | | |
| Regulatory Issues | 7-A | DNR | new legislation to create insurance coverage | DNR could offer bond & clean-up services | | | | | |
| Regulatory Issues | 7-B | DNR | obtain legal authority for agreements between farmers for clean-up | commercial liability & we potentially address thru i amend reg to allow short requirements, depending allow for reduced lease fee (anchors, scoops, etc) | | | | | |
| Regulatory Issues | 8 | DNR | amend commercial use requirement | do not allow lease fees to the lease, which leads to data collected for water farmers (either nearby or DEC's completion of web | | | | | |
| Regulatory Issues | 9 | DNR | amend reg to allow reduced lease fee | encourage hire of Alaska Sea Grant Mariculture Specialist | | | | | |
| Regulatory Issues | 10 | DNR | limit lease fee increases | Develop & circulate mariculture skill-building resources | | | | | |
| Regulatory Issues | 11 | DNR | allow data to be viable | offer professional development too growers, available remotely & in-person | | | | | |
| Regulatory Issues | 12 | DEC | support certification of new labs & testing methods | provides "Introduction to Shellfish/Seaweed Farming" for new farmers or farm employees | | | | | |
| Regulatory Issues | 13-A | DEC | support research into depuration & certification of process | develop a mariculture apprenticeship/mentorship program | | | | | |
| Regulatory Issues | 13-B | DEC | new legislation to establish board or group to represent industry | build on progress to date with informa | | | | | |
| Regulatory Issues | 14 | All | direct regulatory agencies to adopt advocacy approach to mariculture industry | participate in industry career awareness activities | | | | | |
| Regulatory Issues | 15 | All | utilize industry best practices to reduce regulatory hurdles | include mariculture work-force impact analyses | | | | | |
| Regulatory Issues | 16 | All | amend agency regs to allow when best practices are d | evaluate & track participant progress | | | | | |

| | | | | | | | | | |
|-----------------------------|----|------------|--|--|-----------|-------------|--|--|--|
| Investment & Infrastructure | 5 | Investment | new revolving loan fund (or expand existing RFL) | with increased participants, demand for the state's existing RFL may quickly surpass capital | mid-term | 1, 5 | | | |
| Investment & Infrastructure | 6 | Investment | business development training program | financial training targeting development of business plans for new entrants to successfully apply for loans | mid-term | 8 | | | |
| Investment & Infrastructure | 7 | Investment | facilitate partnerships | leverage assets by developing strategic partnerships: gov (local, state, fed), Native, industry, etc | mid-term | 1, 2, 5, 7 | | | |
| Investment & Infrastructure | 8 | Investment | State of AK commitment to support mariculture & comp plan | gain commitment from State to support comp plan & define state role (Gov letter, Leg. Resolution, etc) | near-term | 2, 4, intro | | | |
| Investment & Infrastructure | 9 | Investment | support con't learning thru visits to other regions of world | information sharing between existing industry & potential investors is important to efficient growth of industry | mid-term | GP96 | | | |
| Investment & Infrastructure | 10 | Investment | fact sheet for investors | new investors need info (growth rates, PSP, etc) to develop business plans & assess opportunities; may be included in map tool | long-term | 5, 6 | | | |

| Regulatory Issues | NEW | DNR | Include public outreach during farm lease application process | include new requirement for documentation of public outreach by permittee during farm lease application process; intended to avoid conflict and increase rate of success for new farm apps | 4, 6 | |
|-----------------------------|-----|----------------|---|--|-----------|---------|
| Public Ed & Marketing | 1 | Public Ed | provide public outreach | provide public outreach to multiple audiences to help assure realistic & positive views of mariculture & support mariculture development in AK | 6 | |
| Public Ed & Marketing | 2 | Public Ed | provide sources of practical & factual information | all stakeholders require practical & factual information upon which to form opinions; lack of information create vacuums which fill with misinformation or fear | 6, 7 | |
| Public Ed & Marketing | | Public Ed | coordination of advocacy & info | existing entities perform parts of each function; how do we see it performed in the future? | 2, 6 | |
| Public Ed & Marketing | 2 | Public Ed | identify priority groups & develop effective communication with each | effective communication may be written materials, present at on-site meetings, ongoing coordination with groups or individuals | 6 | |
| Public Ed & Marketing | 3 | Public Ed | identify authority & responsibility for implementation of comp plan | crucial step for the MTF; also important to identify capacity of each | 2 | |
| Public Ed & Marketing | 4 | Public Ed | provide central clearing-house for mariculture info | web-based information related to mariculture in Alaska, including comp plan implementation | 2, 6 | |
| Public Ed & Marketing | 5 | Public Ed | recognize & counter opposition to mariculture & aquaculture | issues include potential for environmental damage, genetics, conflicting users, market competition, aesthetics | 6 | |
| Public Ed & Marketing | 6 | Public Ed | expand formal education in mariculture | expand capacity of University, ANSEP to educate/train for all levels of workers (including researchers, hatchery, business, etc) | 6, 7, 8 | |
| Public Ed & Marketing | | Marketing | consider future contribution mechanism to ASMI funding | existing seafood industry funds portion of ASMI thru industry taxes; other revenue sources are state & federal funds | 9 | |
| Public Ed & Marketing | | Marketing | revise ASMI strategic plan & tag line to include mariculture products & messaging | may need to consider shifting focus away from "wild" messaging to something more inclusive (Alaska Grow, Alaska Pure, etc) | 5, 9 | |
| Public Ed & Marketing | | Marketing | con't to build collaboration between ASMI & Alaska Grow | build synergy with a larger group of Alaska Food Producers; Alaska Grow is already accessible to aquatic farmers | 5, 9 | |
| Public Ed & Marketing | | Marketing | increase awareness of mariculture products | this may help marketing of Alaska seafood products by offering wider range of products to customers | 6, 9 | |
| Public Ed & Marketing | | Marketing | include general education about mariculture at every level of marketing | similar to inclusion of sustainability in wild seafood marketing | 6, 9 | |
| Public Ed & Marketing | NEW | Public Ed | include public outreach during farm lease application process | include new requirement for documentation of public outreach by permittee during farm lease application process; intended to avoid conflict and increase rate of success for new farm apps | 4, 6 | |
| Investment & Infrastructure | 1 | Infrastructure | GIS map tool | provides initial info to potential investor/regulators, while highlighting future research gaps | near-term | 3, 5, 6 |
| Investment & Infrastructure | 2 | Infrastructure | seafood processor outreach | inform existing owners of seafood plants of potential for diversification | mid-term | 5, 6, 9 |
| Investment & Infrastructure | 1 | Investment | amend Mar Rev Loan Fund to include hatcheries | offer support for hatcheries during industry's developmental phase; also need con't effort to align industry needs with private & public funding opportunities | near-term | 1, 4, 5 |
| Investment & Infrastructure | 2 | Investment | new legislation to allow shellfish enhancement | provides a regulatory framework to allow shellfish enhancement & restoration | near-term | 1, 4 |
| Investment & Infrastructure | 3 | Investment | list of funding sources for mariculture development | develop single website outlining & linking to applicable funding sources | near-term | 5 |
| Investment & Infrastructure | 4 | Investment | promote cooperative investment structures | coops offer members many benefits (efficiencies, shared risk, common facilities, seed, markets, etc) & are an model used in both seafood & agriculture | long-term | 1, 5 |

Alaska Mariculture Development Plan

Priority Recommendations

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

Mariculture Task Force wants your feedback...
by Feb. 15th!

Copies of draft *Alaska Mariculture Development Plan*
available at the [MTF website here](#) or on flash drive.

2017 Statewide Farm Applications

If all the new apps (green) are permitted:

- ✓ 50% increase in numbers of farms (15)
- ✓ 400% increase in numbers of acres (~1,100 acres)
- ✓ Increases in oysters and seaweed
- ✓ Locations in SE, PWS, Homer & Kodiak (interest in Aleutians)
- ✓ Larger sizes increase economies of scale & profitability

| ADL | Name (Contact and Company) | Application Type | DNR Received | Acres | Location | Nearest Community | Region | Organisms to Be Cultured |
|--------|---|--|--------------|-------|--|---------------------------|--------|--|
| 107829 | Gregg Parsley, Shikat Bay Oysters, Inc | Amendment | 3/1/2017 | 6 | Shikat Bay | Naukati, POW | SE | Kelp (to be added) |
| 106998 | Ernie and Carol Gladsjo, Jihni Bay Oysters | Amendment | 4/20/2017 | 0.19 | Jihni Bay | Naukati, POW | SE | Pacific oyster currently, None to be added |
| 227591 | Carl R. Liebes, Early Tide Seafarms, LLC | Amendment | 4/27/2017 | 6 | Bear Cove, Kachemak Bay | Homer | SC | Pacific oyster currently, None to be added |
| 105346 | Greg McMillian, Keta Seafoods | Amendment | 5/1/2017 | 4 | Western shore of Peratrovich Island | Klawock, POW | SE | Kelp (to be added) |
| 107362 | Cornelis Bakker, Cornelis Bakker, Inc. | Renewal | 3/22/2017 | 2.8 | Black Island | Ketchikan | SE | Geoducks currently |
| 232720 | Erik O'Brien, Efficient Coastal Resources | New (Lease) & Amendment (Operation Permit) | 1/8/2017 | 198 | Larsen Bay | Larsen Bay, Kodiak Island | WE | Kelp (not specified) |
| 232715 | Greg and Weatherly Bates, Alaska Shellfish Farms | New | 1/9/2017 | 0.8 | Jakolof Bay , Kachemak Bay | Seldovia, Homer | SC | Pacific oysters |
| 232733 | Rob Baer, Alaska Ground Swell, LLC | New | 2/14/2017 | 10 | Onion Bay adjacent Raspberry Island | Port Lions, Kodiak Island | WE | Sugar and Ribbon Kelp |
| None | Bill Fejes, Polar Seafoods | New | 3/3/2017 | 15.23 | Northeast arm of Uganik Bay | Uganik, Kodiak Island | WE | Pacific oysters |
| 232746 | Nicholas Mangini, Kodiak Island Sustainable Seaweed | New (Lease) & Amendment (Operation Permit) | 3/13/2017 | 17 | Women's Bay | Kodiak | WE | Kelp (not specified) |
| 232885 | Mark Scheer, Premium Aquatics, LLC | New | 4/27/2017 | 318 | Bucarreki Bay, adjacent Madrea de Dios | Craig | SE | Pacific oysters, Kelp (not specified) |
| 232886 | Troy Denkinger, Silver Bay Seafoods | New | 4/28/2017 | 182 | Olga Pt, Krestof Sound | Sitka | SE | Pacific oysters |
| 232887 | Troy Denkinger, Silver Bay Seafoods | New | 4/28/2017 | 163 | Beehive Island, Nakwasina Sound | Sitka | SE | Pacific oysters |
| None | Tmi Marsh, OceansAlaska | New | 4/28/2017 | 22.96 | George Inlet | George Inlet, Ketchikan | SE | Sugar and Ribbon Kelp |
| 232900 | Garry White | New | 5/1/2017 | 4.13 | Siginaka Islands, Sitka Sound | Sitka | SE | Pacific oysters |
| 232894 | Alf Pryor, Dead Humpy Creations | New | 5/1/2017 | 50.85 | Near Woody Island Channel | Kodiak | WE | Sugar and Ribbon Kelp |
| 232893 | Roderick Jensen, Sustainable Alaska Farms Enterprise, LLC | New | 5/1/2017 | 24.35 | Simpson Bay | Cordova, PWS | SC | Pacific oysters |
| 232899 | Seawan Gehleach, Simpson Bay Oyster Company | New | 5/1/2017 | 14.35 | Simpson Bay | Cordova, PWS | SC | Pacific oysters |
| 232902 | Beau Perry, Premium Oceanic | New | 5/1/2017 | 34.9 | Middle Bay | Kodiak | WE | Sugar Kelp |
| 232909 | Alexander Schutz, PWS Enterprise LLC | New | 5/1/2017 | 15.25 | Cedar Bay | PWS | SC | Pacific oysters |



Federal Developments



Marine Aquaculture Act of 2017

- Draft bill, written by Senator Wicker (R-MS)
- Designates NOAA as lead agency
- Lays out coordinated federal permitting process
- **Includes opt-out provision for states**
- Creates R&D grant program
- Creates Office of Aquaculture in NOAA to implement
- Appropriates \$350 million over 5 years

U.S. Senate Commerce Committee Hearing

“Growing the Future: Opportunities to Support Domestic Seafood Through Aquaculture”

January 30, 2018

The hearing examined the current state of aquaculture in the U.S., future opportunities for offshore, coastal, and inland communities, and the potential impact on the economy. [Archived here](#). See Senator Sullivan’s questions at 1:45.

Research Projects Funded:



- 1) **MaricultureMap** - Development of a GIS Tool to Inform Mariculture Expansion in Alaska (partners: AFDF, APICDA, TNC)
- 2) **Geoduck Seed Security**: Spawning, Nursery Techniques, & Technology Transfer (partners: OA, AP, SARDF, farmers, Metlakatla)
- 3) **Fecal Coliform Research** to Inform Improved DEC Water Quality Procedures (partners: PSI, farmers, DEC)

Seaweed Farming in Alaska



*Available
online*



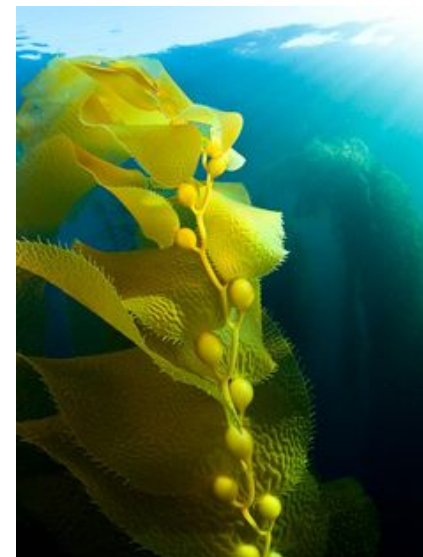
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ALASKA SEA GRANT
MARINE ADVISORY PROGRAM
ASG-63 2017
<https://doi.org/10.4027/sfa.2017>

Research Funded - U.S. Dept. of Energy

Seaweed as a Biofuel



Advanced Research Projects Agency – Energy (ARPA-E)

\$22 million awarded for 18 projects, focus on technological challenges to growing and harvesting seaweed efficiently & cost-effectively; develop tools to enable US become a leading producer of seaweed helping to improve U.S. energy security and economic competitiveness.

Alaska Project: University of Alaska Fairbanks , Mike Stekoll – Project Leader; Project Team includes AFDF, R&M Engineering, Ketchikan & Kodiak farmers, Blue Evolution.

*“...develop replicable scale model farms capable of the cost effective production of sugar kelp, a type of seaweed...a particular emphasis will be on the development of cost-effective harvesting methods based on technologies applied in the **commercial fishing industry**...”*

Mariculture in the News



Chinese Companies to invest \$200 Million for Scallop Growing in Russia

SEAFOODNEWS.COM [China Aquatic] Translated by Amy Zhong
Dec 7, 2016

According to the government of Primorsky Krai, some Chinese companies plan to invest US \$200 million to raise scallops, sea cucumbers and mussels there.

The deputy secretary-general of China Overseas Development Association is reported to have met and talked with the vice governor of Primorsky Krai. And Chinese companies intend to start the operation of their aquaculture facility there in May, 2017 And this facility will create thousands of new jobs.

Chinese investors are attracted by the good conditions around Vladivostok and other advanced development zones, said the deputy secretary-general. Primorsky Krai is attractive for investment, especially its aquaculture industry.

According to investors, the trial stage of this project will last about three years. Dalian's Gourmet Ocean product is their important sales partner.

Seafood investment fund plans up to 10 new deals by end of 2018

IntraFish



As geoduck, oyster demand rises, Taylor Shellfish eyes \$100m turnover



Vkhøilvk#p ryh#grz q#d#frqyh|hu#
dw#rd|aru#Vkhøilvk*v#Vkhøiq/#
Z dvk kjwq#arfdwq1#

Shellfish move down a conveyor at Taylor Shellfish's Shelton, Washington location.

February 7, 2017, 1:57 pm

[Jason Smith](#)

With demand for the company's oysters and geoducks, particularly from Asia and the US, Washington-based Taylor Shellfish Farms eyes \$100 million in sales by 2019, up from \$70m in 2016.

undercurrentnews
seafood business news from beneath the surface

Bren Smith, GreenWave:

Owns 20-acre farm in CT;
grows oysters, kelp, mussels, scallops

