UNDERSTANDING AQUATIC FARMING ADF&G PERMITTING

CYNTHIA PRING-HAM

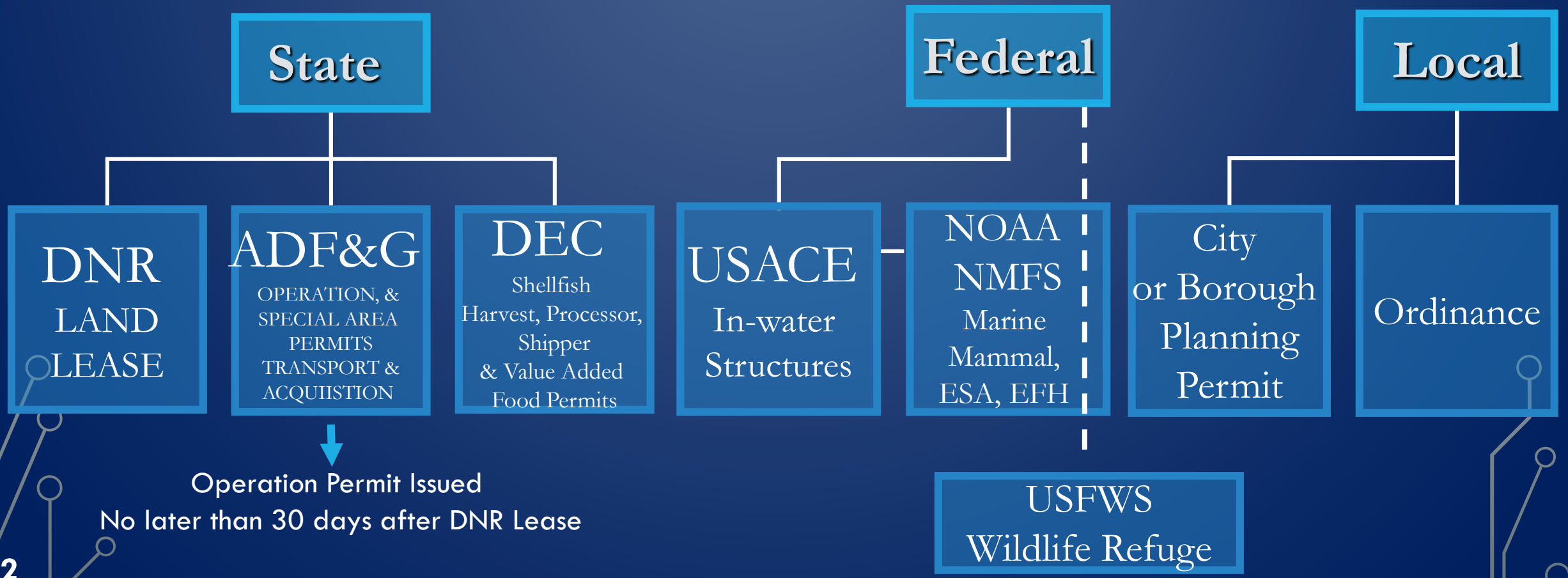
ADF&G AQUATIC FARMING COORDINATOR

KODIAK REGIONAL MARICULTURE CONFERENCE

SEPTEMBER 11, 2019

KODIAK, AK

MAJOR STATE, FEDERAL, LOCAL AUTHORIZATIONS



Operation Permit Issued
No later than 30 days after DNR Lease

ALASKA DEPARTMENT OF FISH AND GAME

WHAT'S OUR ROLE IN AQUATIC FARMING?

Aquatic Farm Act Implementation (AK Statutes 16.40.100-199; 1988)

The department permits and regulates aquatic farming in the state in a manner that ensures:

1. the protection of the state's fish and game resources (and uses of those resources) and

2. improves the economy, and well being of the citizens of the state.

AQUATIC FARMING PROVISIONS

- ✓ Shellfish and aquatic plants only
- ✓ Commercial use only
- ✓ Finfish farming prohibited
- ✓ Indigenous species
  - Exception: Pacific oysters allowed from a certified or approved seed source only

ADF&G PERMITS

1. **Aquatic Farming Operation Permit - 10 yrs**

   To operate an aquatic farm or hatchery

2. **Stock Transport Permit - 1 yr**

   To transfer stock to, from, or between an aquatic farm, hatchery, or stock acquisition site (waters of the state)

ADF&G PERMITS

3. **Stock Acquisition Permit - 1 yr**

   To collect wild stock from outside of an aquatic farm site, for the purposes of providing broodstock or seedstock to a hatchery or farm

4. **Shellfish Import Certification**

   (Hatchery/Nursery) 1yr

5. **Shellfish Instate Seed Distributor Approval** (Hatchery/Nursery) 1–3+ yrs

ADF&G KEY TRANSPORT CONDITION IN OPERATION PERMIT

To minimize the risk of genetic or disease impacts on wild populations, hatchery-cultivated macroalgae seedstock transport for out planting of seedstock must be within 50 km (by water) of the broodstock (parent) collection site.

AQUATIC FARM SITE SUITABILITY / SITE SELECTION

MUST BE SUITABLE FOR THE FARM OR ORGANISM BEING CULTURED

Physical and Biological Characteristics

- ✓ **Protected**
- ✓ **Exchange rates, water temps, currents, salinity, food availability, light, and suspended sediments**
- ✓ **Suspended - Water depth** (40-60 ft or greater)
- ✓ **On bottom - Substrate composition, Intertidal exposure**

Other considerations

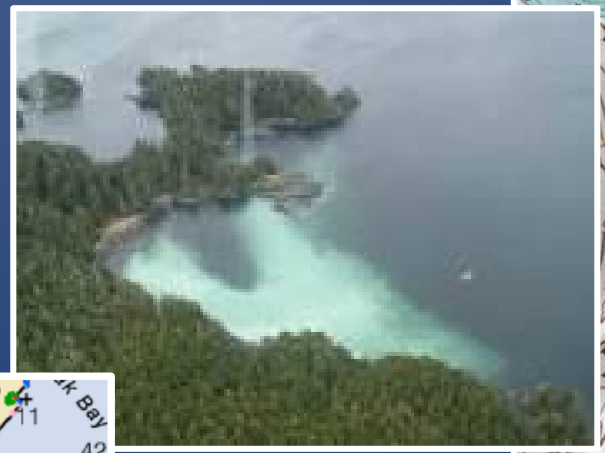
- ✓ **Fouling organisms**
- ✓ **Predation**
- ✓ **Pollution**
- ✓ **Paralytic Shellfish Poisoning (PSP)**
- ✓ **Distance from labor pool and market**
- ✓ **Vicinity to other farms**

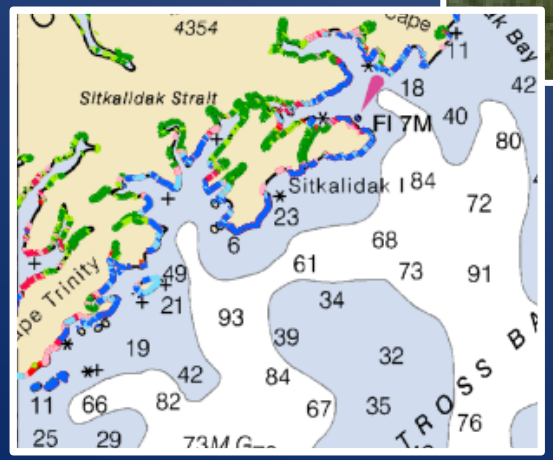
AQUATIC FARM SITE SUITABILITY / SITE SELECTION

MAY NOT SIGNIFICANTLY AFFECT FISH, WILDLIFE, OR THEIR HABITATS IN AN ADVERSE MANNER

PROXIMITY TO SENSITIVE AREAS:

- Anadromous Fish Streams
- Herring Spawning Areas
- Kelp and Eelgrass beds





AQUATIC FARM SITE SUITABILITY / SITE SELECTION

MAY NOT SIGNIFICANTLY AFFECT FISH, WILDLIFE, OR THEIR HABITATS IN AN ADVERSE MANNER

PROXIMITY TO SENSITIVE AREAS CONT:

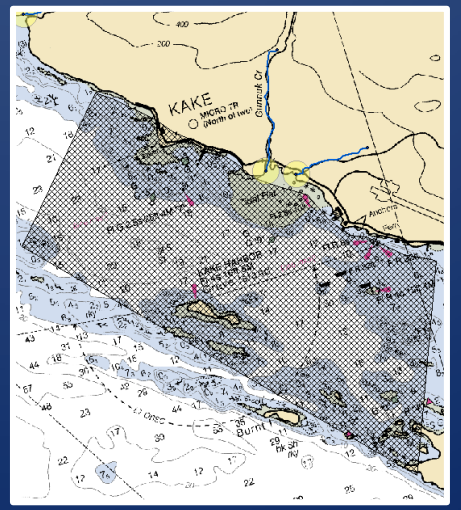
- Shorebirds and waterfowl concentrations
- Harbor seals, seal lion, walrus concentrations
  - Guidance – Possibility of significant adverse effects if within 500 meters from haulout AND large haulouts (> 50 animals)

AQUATIC FARM SITE SUITABILITY / SITE SELECTION

MAY NOT REQUIRE SIGNIFICANT ALTERATIONS IN TRADITIONAL FISHERIES OR OTHER EXISTING USES OF FISH AND WILDLIFE RESOURCES

PROXIMITY TO EXISTING USE AREAS

- Existing commercial, subsistence, sport, or personal use areas for fish, shellfish, or aquatic plants
- Salmon Hatchery - special harvest areas or terminal harvest areas
- Major anchorages and floatplane access

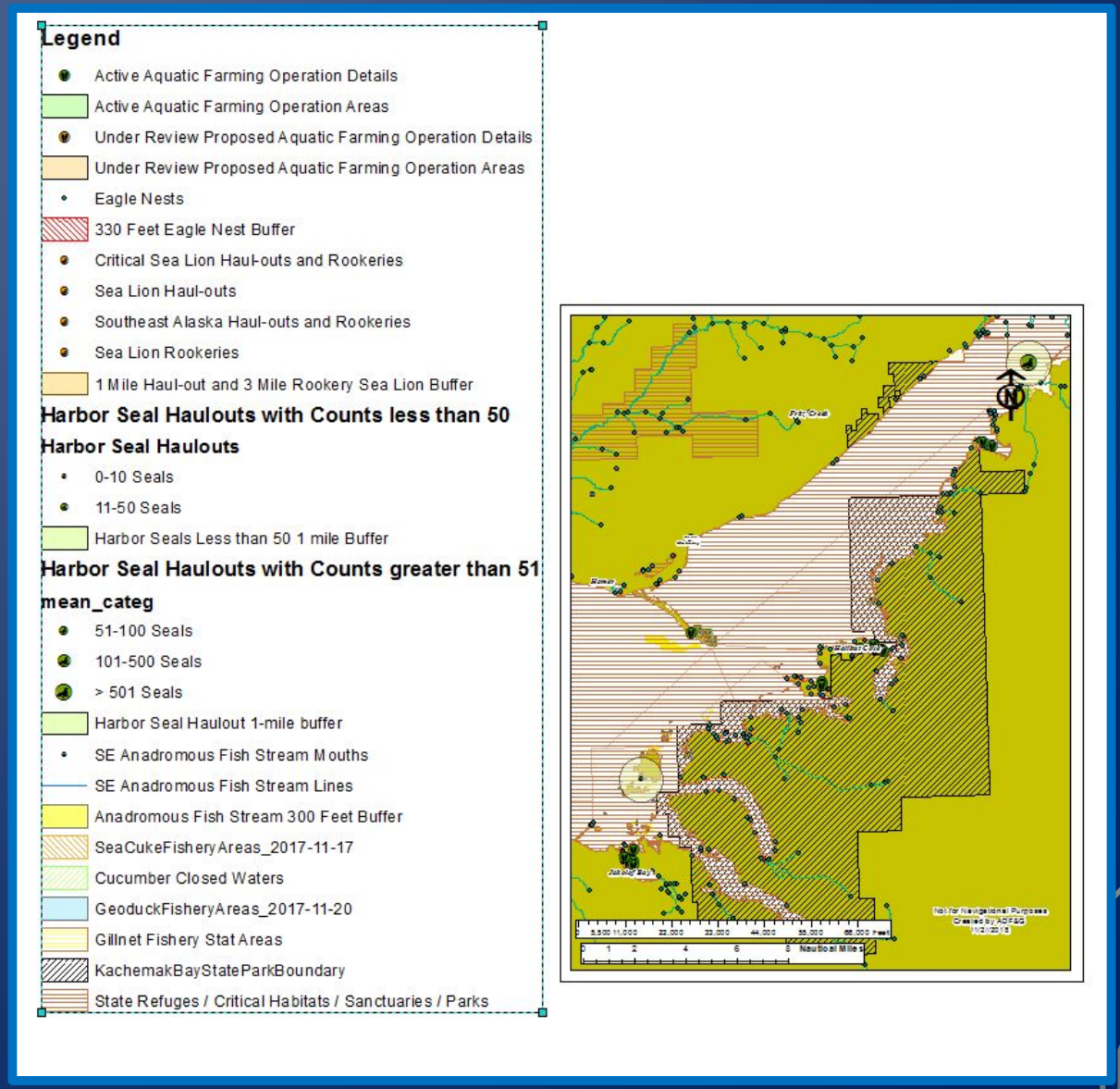


AQUATIC FARM SITE SUITABILITY / SITE SELECTION

PROXIMITY TO RESTRICTED AREAS

Designated Areas:

- State refuge and sanctuaries
- State parks and marine parks
- State critical habitat areas (CHA) except Fox River / Kachemak Bay



WHAT IS THE DEFINITION OF AQUATIC FARMING IN ALASKA?

- Growing, farming, or cultivating aquatic farm products in captivity or under positive control by means of

1. **managed cultivation** for limited or no mobility species (e.g. oyster, kelp)
2. **enclosed within an escape–proof barrier** that is natural or artificial for motile species (e.g. sea cucumber, sea urchin)

WHAT THIS TERM CALLED MANAGED CULTIVATION?

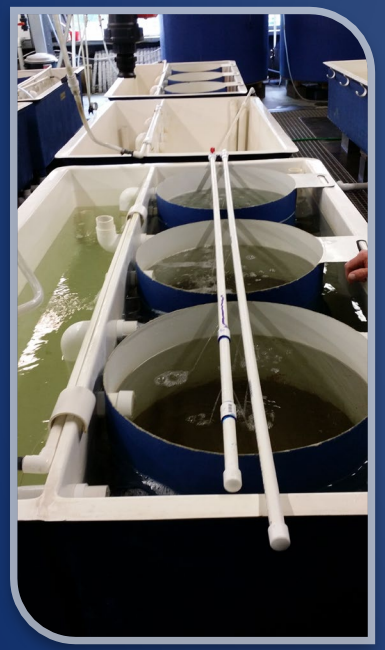
Improve productivity of the species that is intended for culture at the aquatic farm **above what would occur in natural conditions**

Photo by Nick Mangini

TYPES OF MANAGED CULTIVATION

1. Import of hatchery-produced or cultivated seed

HATCHERY SEED PRODUCTION



<u>Shellfish</u>

- Broodstock conditioned and spawned
- Production of Algae for feed
- Eyed-larvae to seed reared to 3–4 mm

<u>Seaweed - Kelp</u>

- Fertile Mature Blades with Sorus
- Spore Release / Inoculate Solution
- Light and Nutrient Solutions
- Sporophyte on string wrapped PVC

NURSERY
SEED REARING & CULTURE

REMOTE SETTING NURSERY

Eyed-larvae settles out and becomes spat

Feed Phytoplankton and Diatoms

Downwellers (200 µ) / Upwellers (240 – 400 µ)

Seedstock reared up to 3-4 mm

INWATER NURSERY

Seedstock cultured in marine waters

Fluid Upwelling System (FLUPSY) with paddle wheel

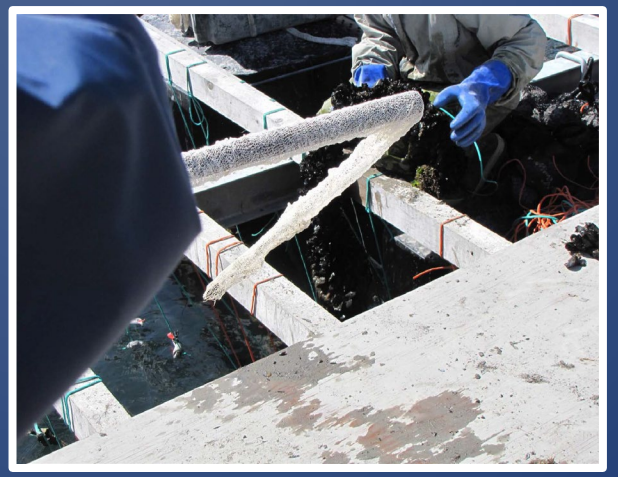
Brings in plenty of food phytoplankton

Seedstock reared from 3 – 15+ mm

TYPES OF MANAGED CULTIVATION CONT.

2. Import of naturally-produced seed from either onsite or offsite

Kelp on oyster longline



Blue Mussel culture socks

By catch in oyster tray culture gear (scallops)

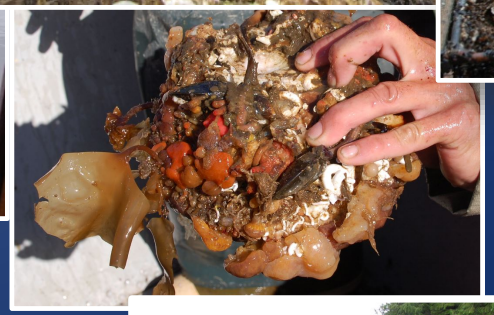
Blue mussel fouling on stacked culture trays

Blue Mussel natural set lines

Scallop culture gear - small scale

TYPES OF MANAGED CULTIVATION CONT.

3. Density manipulation by culling and redistribution



4. Reduction of competing species
5. Predator exclusion

Predator Netting

TYPES OF MANAGED CULTIVATION CONT.

6. Programming harvest to optimize growth and shellfish & aquatic plant condition

   (e.g. Kelp 4-6 months Oysters 3-4 yrs)

7. Habitat improvement

Photo by Nick Mangini

WHAT IS REQUIRED TO APPLY FOR AN AQUATIC FARM?

1. A COMPLETED JOINT-AGENCY APPLICATION
2. ADDITIONAL DOCUMENTS
   a. OPERATION AND DEVELOPMENT PLAN(S)
   b. PROJECT DESCRIPTION
   c. GENERAL LOCATION MAP (USGS)
   d. DETAILED LOCATION MAP (NOAA CHART)
   e. SITE PLAN - OPERATION LAYOUT AND LISTED ITEMS
   f. CROSS-SECTIONAL DIAGRAMS
   g. DETAILED DRAWINGS

AQUATIC FARM PROGRAM APPLICATION

You are encouraged to submit a completed application as early in the filing period as possible. The 2012 application form must be used and properly completed before state agencies can process your project. **An incomplete application will not be processed.** A checklist is included to assist you in meeting this requirement. The best way to facilitate the review of your application is to schedule a pre-application meeting with DNR and ADF&G to discuss your project. The original application including attachments and all required fees must be delivered and physically present in the Alaska Department of Natural Resources office no later than 5:00 p.m. on April 30th.

The project location is in: (Check one) **Southeast Alaska** **Southcentral Alaska**
(Southeast = Projects south of or in the Yakutat area / Southcentral = Projects north of Yakutat

A. APPLICANT INFORMATION

Name

Business Name (If Applicable)

Mailing Address (PO Box or Street Address)

City State Zip

Email Address

Home/Office Phone Cell Phone

If you live in a remote area please provide a contact person (name, phone & email address) who can be easily reached.

Contact Name

Contact Phone Number

Business Partner Name (If applicable)

Business Partner Email Address (If applicable)

Business Partner Phone (If applicable)

FEW THINGS TO REMEMBER FOR SUBMITTALS

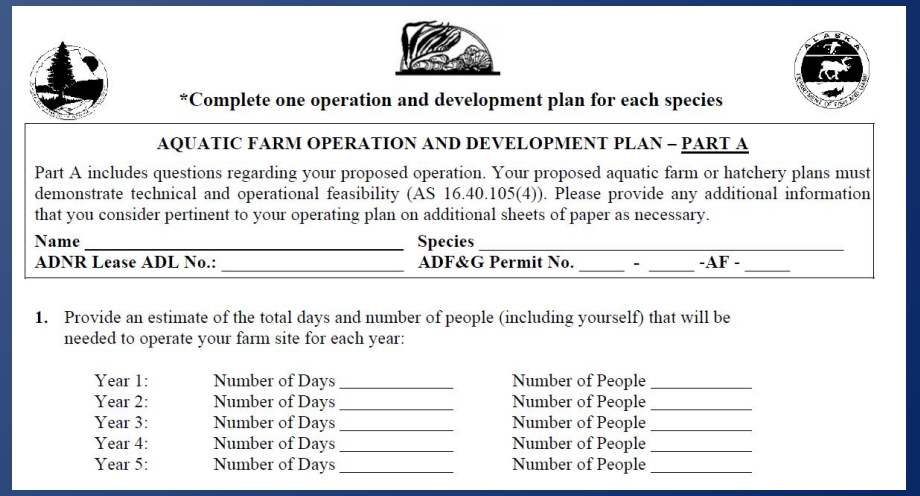
- One Operation and Development Plan (ODP) for each species to be cultured
- For Project Description use MS Word outline and provide for review
  - For culture method, describe “activities” used from acquiring seedstock up to harvest plus seed stocking schedules.
  - For harvest method, describe “activities” and harvest equipment to use and harvest schedules.
  - For culture gear, describe plans for removal and reinstallation and time period
    - (e.g. remove and reinstall submerged longline system on an annual basis)
- For maps: ArcGIS Online application
- Make sure all numbers, dimensions, and types are consistent throughout
- For all depths (e.g. below bottom of gear or surface to substrate bottom), specify Mean Low Water (MLLW) in ft

AQUATIC FARMING OPERATION PERMIT OPERATION AND DEVELOPMENT PLAN

Most important:

Operation, development, & staffing plans for the farm **MUST demonstrate technical and operational feasibility**

How do you do that?



*Complete one operation and development plan for each species

AQUATIC FARM OPERATION AND DEVELOPMENT PLAN – PART A

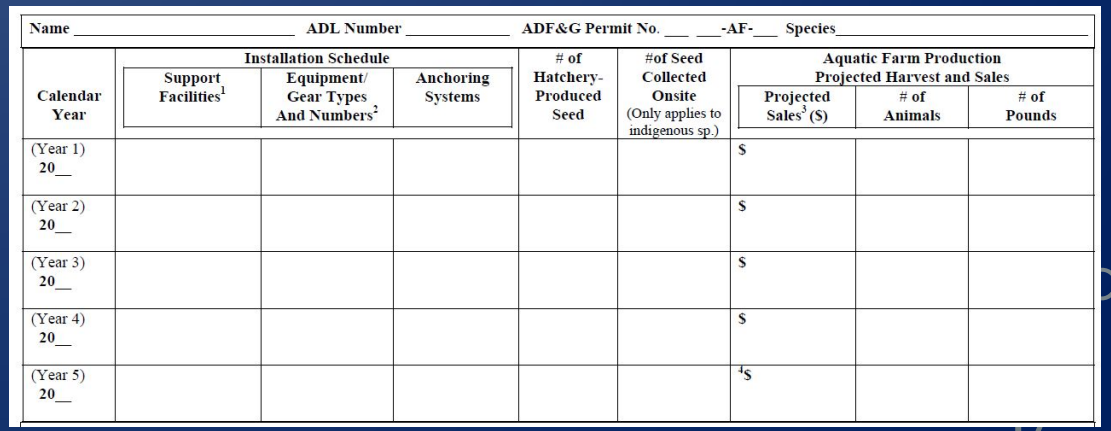
Part A includes questions regarding your proposed operation. Your proposed aquatic farm or hatchery plans must demonstrate technical and operational feasibility (AS 16.40.105(4)). Please provide any additional information that you consider pertinent to your operating plan on additional sheets of paper as necessary.

Name _____ **Species** _____

ADNR Lease ADL No.: _____ **ADF&G Permit No.** ____ - ____ -AF - ____

1. Provide an estimate of the total days and number of people (including yourself) that will be needed to operate your farm site for each year:

Year 1:	Number of Days _____	Number of People _____
Year 2:	Number of Days _____	Number of People _____
Year 3:	Number of Days _____	Number of People _____
Year 4:	Number of Days _____	Number of People _____
Year 5:	Number of Days _____	Number of People _____



Name _____ **ADL Number** _____ **ADF&G Permit No.** ___ ___-AF-___ **Species** _____

Calendar Year	Installation Schedule: Support Facilities[1]	Installation Schedule: Equipment/ Gear Types And Numbers[2]	Installation Schedule: Anchoring Systems	# of Hatchery-Produced Seed	#of Seed Collected Onsite (Only applies to indigenous sp.)	Aquatic Farm Production Projected Harvest and Sales: Projected Sales[3] ($)	# of Animals	# of Pounds
(Year 1) 20__						$		
(Year 2) 20__						$		
(Year 3) 20__						$		
(Year 4) 20__						$		
(Year 5) 20__						[4]$		

AQUATIC FARMING OPERATION PERMIT OPERATION AND DEVELOPMENT PLAN REVIEW

1. Schedule is consistent with life history of species intended to be cultured.
2. Shows improvement in productivity of the organism above what would occur in natural conditions
3. Summarizes installation and maintenance of support facilities / culture gear/ anchoring systems

COMPLETING THE OPERATION AND DEVELOPMENT PLAN: PART A – HEADING AND STAFF PLAN

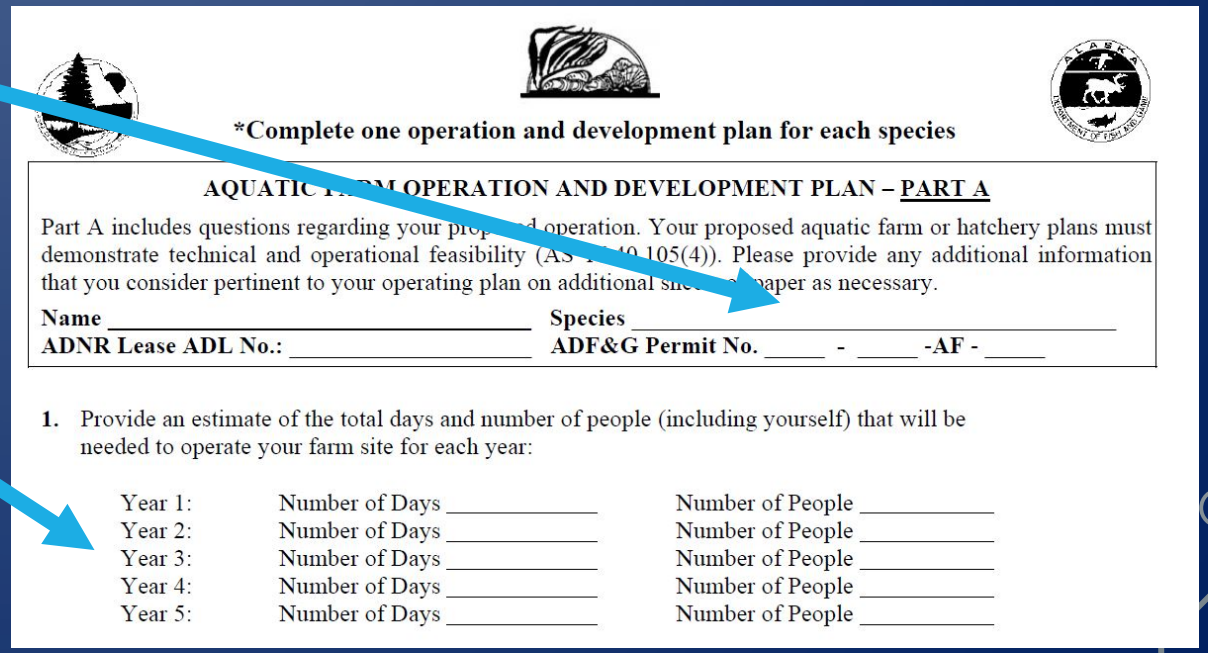
Scientific Name and Common Name

Species Sugar Kelp, Saccharina latissima

Staff Plan

Is it technically and operationally feasible?

Year 1:	Number of Days	30	Number of People	4
Year 2:	Number of Days	30	Number of People	4
Year 3:	Number of Days	30	Number of People	4
Year 4:	Number of Days	30	Number of People	4
Year 5:	Number of Days	30	Number of People	4



*Complete one operation and development plan for each species

AQUATIC FARM OPERATION AND DEVELOPMENT PLAN – PART A

Part A includes questions regarding your proposed operation. Your proposed aquatic farm or hatchery plans must demonstrate technical and operational feasibility (AS 16.40.105(4)). Please provide any additional information that you consider pertinent to your operating plan on additional sheets of paper as necessary.

Name _____ **Species** _____

ADNR Lease ADL No.: _____ **ADF&G Permit No.** ____ - ____ -AF - ____

1. Provide an estimate of the total days and number of people (including yourself) that will be needed to operate your farm site for each year:

Year 1:	Number of Days	_____	Number of People	_____
Year 2:	Number of Days	_____	Number of People	_____
Year 3:	Number of Days	_____	Number of People	_____
Year 4:	Number of Days	_____	Number of People	_____
Year 5:	Number of Days	_____	Number of People	_____

Scientific Name and Common Name

OPERATION AND DEVELOPMENT PLAN: PART A - SITE MONITORING

2. Site Monitoring/Maintenance

a. How often, in days per month, do you intend to monitor your site for things such as adequate anchoring, disease, exotic species settlement, fouling, gear drift, snow load, wind damage, vandalism, etc.?

Growing season 4 (days/month) **Winter months** 4 (days/month)

b. Where will you store any farm gear and/or equipment when not in use? Longlines, buoys, depth control systems, and any anchor lines that are not currently being used onsite will be stored on my private property located in the Kodiak on Kodiak Island.

c. How will you keep the gear and shellfish free of fouling organisms (hot-dip, air dry, pressure washing, etc.)? For kelp, in order to minimize any fouling organisms such as bryozoans, barnacles, mussels, and algal epiphytes on the kelp product and gear, all kelp, longlines, depth control systems, and buoys, will be removed from the water after each harvest annually. All culture gear and equipment will be cleaned and stored on land until just prior to planting of seedstarts.

d. How will you manage incidental species over the course of operations (sea urchins, sea cucumbers, butter clams, or other non-targeted species)? For kelp, incidental species on product and longlines, buoys, and depth conttol systems, will be removed by hand or knocked off by knife and returned at the site into marine waters.

e. For on-bottom culture, if you intend to use predator netting, how long will you keep netting over your product? N/A (months)

OPERATION AND DEVELOPMENT PLAN: PART A – RECORDKEEPING

3. Recordkeeping

a. What methods are you going to use to measure the success of your operation (growth, survival or mortality rates, production, etc.)? For kelp, we plan to use kelp growth and final production to ascertain whether our operation is meeting our business plan goals.

b. Will you maintain records of aquatic farm product, such as counts and measurements to track survival and growth? **Yes** ☑ **No** ☐ **Describe:** For kelp, we plan to measure the the length of kelp on a monthly basis after seedstart lines are unwrapped on longlines. Final yield wet weight per meter of seeded line and length of 5 plants on the meter of line will be recorded at final yearly harvest.

c. Do you plan to record other physical or environmental parameters at your site such as water temperatures and salinity? **Yes** ☑ **No** ☐ **Describe:** Water temperature, salinity, turbidity, and nitrogen levels will be monitored and logged at the site.

Scientific Name and Common Name

OPERATION AND DEVELOPMENT PLAN: PART A – SEED ACQUISITION

6. Seed Acquisition

a. Which certified seed source(s) will you use? For kelp, Blue Evolution Hatchery in Kodiak

b. Applicable for indigenous species (mussels, scallops, abalone, etc.), how do you intend to collect wild seed? Not applicable as do not intend to collect wild seed as part of this operation. We will work with the permitted hatchery as a collector approved to manually acquire fertile blades from an area within 50 km by water of the permitted aquatic farm outplanting location where kelp seedstarts on line will be placed.

Scientific Name and Common Name

OPERATION AND DEVELOPMENT PLAN: PART B – INSTALLATION SCHEDULE

Years Filled in

Calendar Year	Installation Schedule: Support Facilities[1]	Installation Schedule: Equipment/ Gear Types And Numbers[2]	Installation Schedule: Anchoring Systems	# of Hatchery-Produced Seed	#of Seed Collected Onsite (Only applies to indigenous sp.)
(Year 1) 20_20		10 - 600 ft of submerged longlines; 100 - depth control systems; 50 - LD-1 polyform buoys. Reinstalled and removed each yr	12 - 400 lb and 2 - 600 lb cement anchors; 12 - 400 ft of scoping line; 10 - polyform A3 buoys; 3 - 350 ft crosslines. All anchoring systems remain installed onsite.	~1.5 million sporophytes (250 seed / ft of line)	
(Year 2) 20_21		Same as above		Same as above	

Number and Types

Add any installation details

Seed Acquired

For Kelp:

No. and seed / ft

For Oyster: No.

STANDARD CULTURE GEAR AND EQUIPMENT

Raft & Trays

Longlines & Lantern Nets

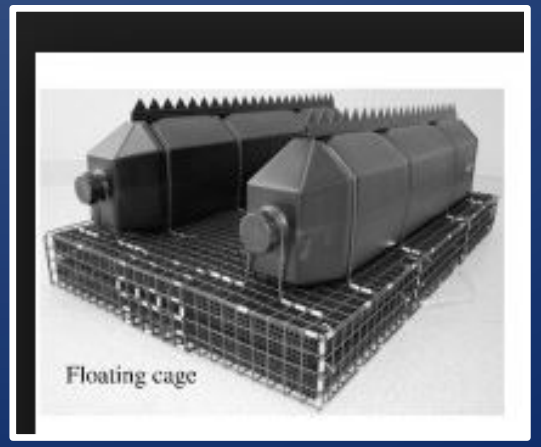
Longlines & Trays

Floating Bags

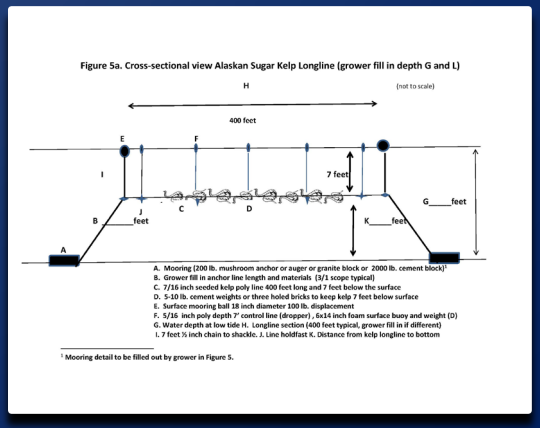
Flip-flop Bags

PVC Tubes / predator netting

Floating cages



Submerged longlines



Longlines – large, more exposed areas or less current; Rafts for small sites with sufficient current

OPERATION AND DEVELOPMENT PLAN: PART B – INSTALLATION SCHEDULE

For Kelp – harvest in 2nd yr

For Oyster – harvest in 3rd or 4th yr

Aquatic Farm Production
Projected Harvest and Sales

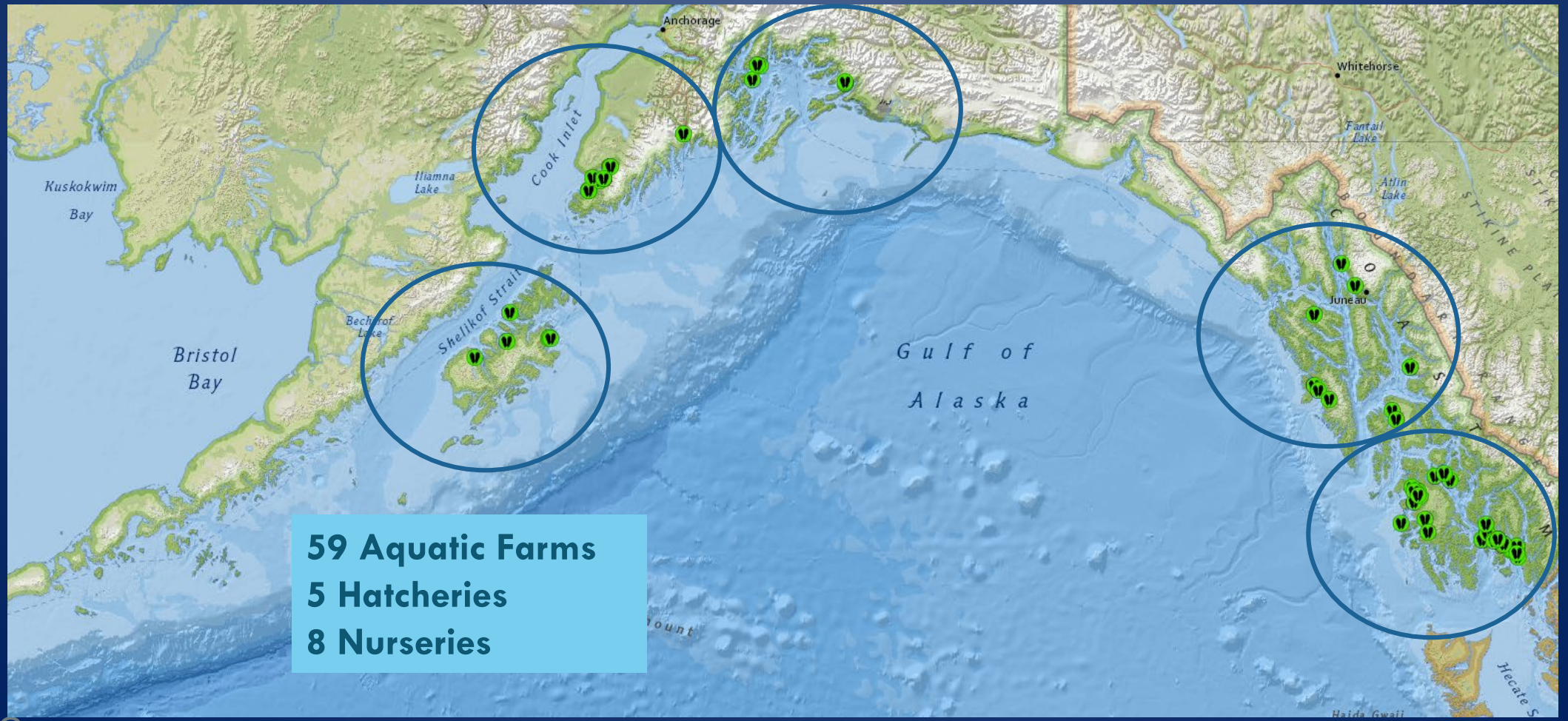
Projected Sales[3] ($)	# of Animals or Plants	# of Pounds
$		
$ 24,000		48,000
$ Same as above		Same as above

Kelp Sales – Investigate market and estimate sales based on price per lb. harvested

For Oysters – use Numbers sold column

For Kelp – use Pounds sold column

WHERE ARE PERMITTED AQUATIC FARMING OPERATIONS IN ALASKA?



WHAT ORGANISMS ARE APPROVED TO CULTURE FOR PERMITTED OPERATIONS?

LIMITED AND NO MOBILITY ORGANISMS

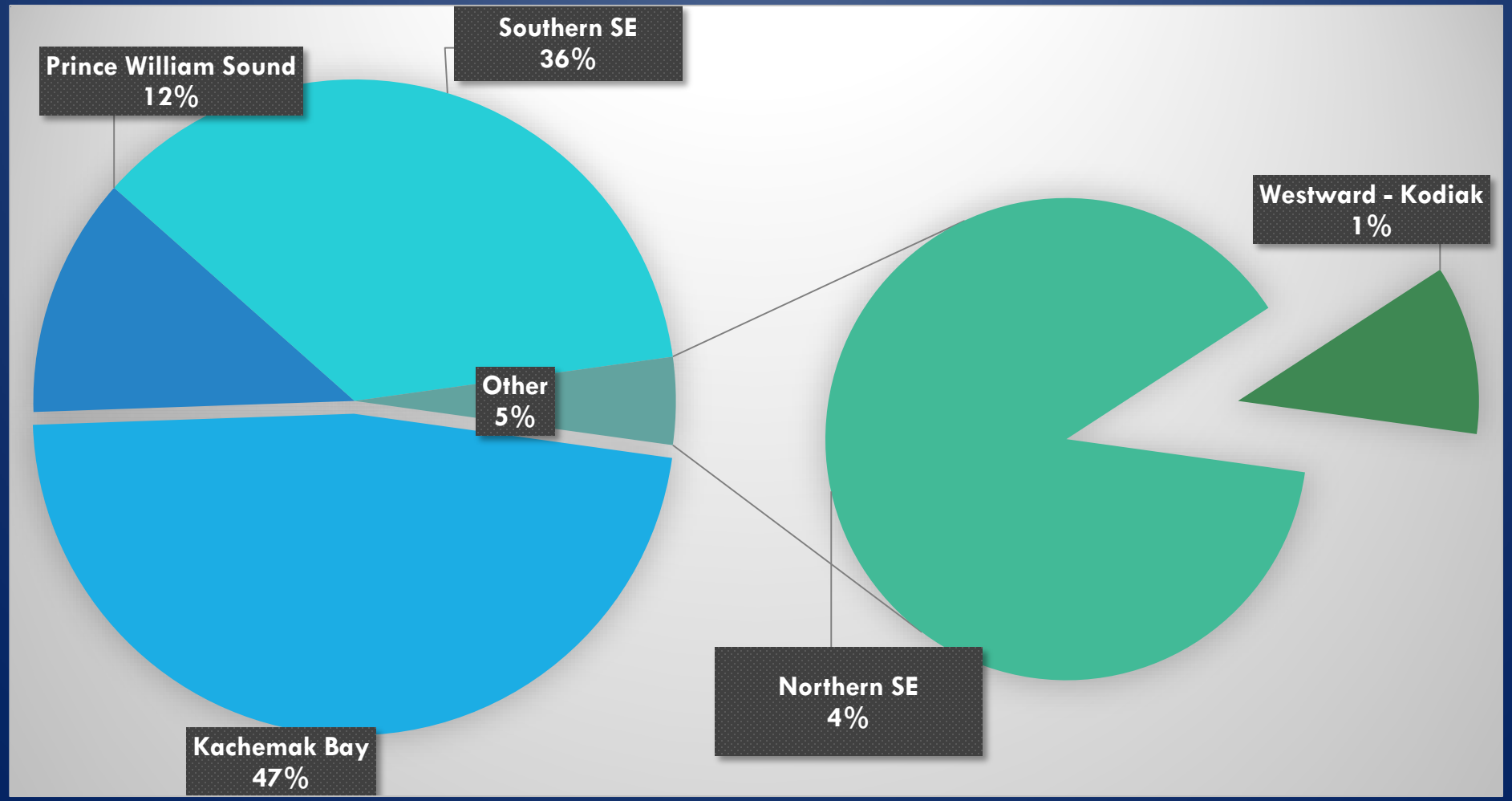
- Bivalves: Pacific oysters*, Geoduck, Blue mussel, Littleneck clam
- Macroalgae: Sugar kelp, Bull kelp, Ribbon kelp, Three-ribbed kelp, Giant kelp, Pyropia sp., and Palmaria sp.

MOBILE ORGANISMS

- Scallop (purple hinged, rock, pink, spiny), Cockles, Sea urchins (red, green, and purple), Sea cucumbers

*** Pacific oysters are a non-native species – allowed to be imported into the state from certified sources using Pacific Northwest broodstock.**

AQUATIC FARM PRODUCTION REGIONAL DISTRIBUTION



* Based on 2018 Annual Reports from Permitted Operators

AQUATIC FARM SHELLFISH PRODUCTS CULTURED AND SOLD

PACIFIC OYSTER

(*Magallana gigas*)

~1.9 million produced

26 operations

6% INC

1º species sold (93.5%)

BLUE MUSSEL

(Mytilus trossulus)

1,270 lbs. produced

7 operations

5% DEC

PACIFIC GEODUCK

(*Panopea generosa*)

Confidential

Data based on 2018 annual reports provided by operators

AQUATIC FARM AQUATIC PLANT PRODUCTS CULTURED AND SOLD

SUGAR KELP

(*Saccharina latissima*)

BULLWHIP KELP

(*Nereocystis luetkeana*)

RIBBON KELP

(*Alaria marginata*)

By 2018, 7 farms produced 89,279 lbs. of these 3 kelp species combined.

Data based on 2018 annual reports provided by operators

WHY DO AQUATIC FARMING?

1. Sustainable
2. Economic opportunity
3. Opportunity to innovate
4. Opportunity to transfer technology
5. Opportunity to educate
6. Quality of life
7. Heritage
8. Food Security
9. Habitat for other species

BENEFITS

QUESTIONS

For additional assistance, please contact:
Aquaculture Section/Commercial Fisheries Division
Alaska Department of Fish and Game
P.O. Box 115526, Juneau, AK 99811-5526
(907) 465-6150 - cynthia.pring-ham@alaska.gov
(907) 465-4724 - michelle.morris@alaska.gov
(907) 465-4325 - garold.pryor@alaska.gov
Fax: (907) 465-4168

General Aquatic Farming email: dfg.dcf.aquaticfarming@alaska.gov
ADF&G:
http://www.adfg.alaska.gov/index.cfm?adfg=fishingaquaticfarming.main
APPLICATION:
https://www.adfg.alaska.gov/index.cfm?adfg=aquaticfarming.general_opening