

**STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINING, LAND AND WATER
SOUTHCENTRAL REGION LAND OFFICE**

**PRELIMINARY FINDING AND DECISION
AQUATIC FARMSITE LEASE**

**APPLICANT: THOMAS MANNING
ADL #108089
DBA KRESTOF CLAM COMPANY**

LOCATION: SIGINAKA ISLAND GROUP, SITKA SOUND

The Department of Natural Resources is accepting public comment on the following preliminary decision document for an aquatic farm site proposal. **Written comments must be received on or before 5:00 p.m., Thursday, September 15, 2011.**

PROPOSED ACTION: The applicant is proposing to construct up to three, 12 ft. x 28 ft. floating, tidal-powered, upwelling nursery systems to be located in non-herring spawning areas in 3 different areas of the Siginaka Islands, approximately 8 miles northwest of Sitka, Alaska. Each nursery system will have a footprint of 120 ft. x 120 ft. (0.33 acres) to allow for enough room for the structure to turn with the tide and accommodate anchor line scope. The nursery systems will be designed to acclimate and grow geoduck spat to planting size and then transported to an existing geoduck farm site in Krestof Sound. .

Each systems basic design consists of a floating tank structure with a wide scoop at the end, which directs incoming tidal water up into suspended bins that hold the geoduck spat or seed which is secured on a screen. The water moves up through the seed mass, passes out into a collecting trough above, and exits at the rear of the unit. The systems are anchored and turn with the tide, so the scoop always faces the tidal flow. They require ample area to rotate with the turning of the tide.

Note: This nursery will be used in conjunction with the permit holder's current aquatic farm operations under ADL-106834 and DFG-01-25A-AF-SE that is located nearby within Krestof Sound, approximately 12 miles northwest of Sitka, Alaska, on state-owned tide and submerged lands.

Access to the site is by boat. The proposed location is only accessible by boat or floatplane. The three sites total an area of 0.99 acres and are shown on the location map attached to this decision.

AUTHORITY: AS 38.05.035; AS 38.05.070; AS 38.05.083; AS 38.05.127; AS 38.05.128; 11 AAC 51; and 11 AAC 63

This decision addresses and is based on those issues under the authority of the Department of Natural Resources (DNR) under Title 38 of the Alaska Statutes and Title 11 of the Alaska Administrative Code. This decision's purpose is to decide on whether or not to issue a DNR lease and does not make any determinations whatsoever on the issuance of other agency

authorizations necessary for aquatic farming activities.

ADMINISTRATIVE RECORD: The administrative record for the application submitted is file number ADL 108089.

LOCATION:

USGS MAP COVERAGE: Sitka A-5

NAUTICAL CHART: 17324

LEGAL DESCRIPTION: Sections 29 and 30, Township 54 South, Range 63 East, Copper River Meridian

LATITUDE / LONGITUDE:

Parcel 1: Suspended Nursery Area - 120 ft x 120 ft = 0.33 acre

NE Corner 1:	57° 9.428' N,	135° 26.223' W
SE Corner 2 :	57° 9.414' N,	135° 26.248' W
SW Corner 3:	57° 9.427' N,	135° 26.274' W
NW Corner 4:	57° 9.442' N,	135° 26.249' W

Parcel 2: Suspended Nursery Area - 120 ft x 120 ft = 0.33 acre

NE Corner 1:	57° 9.474' N,	135° 27.168' W
SE Corner 2:	57° 9.456' N,	135° 27.182' W
SW Corner 3:	57° 9.464' N,	135° 27.216' W
NW Corner 4:	57° 9.482' N,	135° 27.201' W

Parcel 3: Suspended Nursery Area - 120 ft x 120 ft = 0.33 acre

NE Corner 1:	57° 9.324' N,	135° 26.802' W
SE Corner 2:	57° 9.306' N,	135° 26.816' W
SW Corner 3:	57° 9.314' N,	135° 26.850' W
NW Corner 4:	57° 9.332' N,	135° 26.836' W

GEOGRAPHIC: The proposed nursery sites will be located on state-owned tide and submerged lands within the Siginaka Islands island in Sitka Sound, approximately 8 miles northwest of the community of Sitka, Alaska.

POLITICAL INFORMATION:

BOROUGH / MUNICIPALITY: This application is inside the City and Borough of Sitka and is subject to their planning and zoning requirements/restrictions.

REGIONAL CORPORATION, NATIVE VILLAGES AND TRIBES: Sealaska Corporation, Shee Atika, Incorporated, Sitka Tribe of Alaska,

FISH AND GAME ADVISORY COMMITTEES: Sitka Fish and Game Advisory Committee

TITLE:

ACQUISITION AUTHORITY: Submerged Lands Act of 1953. (P.L. 31, 83rd Congress, First Session; 67 Stat. 29); Equal Footing Doctrine; Section 1 of the Alaska Statehood Act.

TITLE REPORT: Report was requested on July 13, 2011.

PLANNING AND CLASSIFICATION:

LAND MANAGEMENT PLAN: Northern Southeast Area Plan (NSAP), Southern Region – Admiralty, Baranof, and Chichagof, adopted October 15, 2002. The region information describes known human and/or fish and wildlife uses and important habitat or resources, and provides guidelines when considering new requests for use within the area.

SURFACE CLASSIFICATION: The NSAP classifies state owned tidelands in this area as settlement under Classification Order No. SE-02-001. This classification allows aquatic farming activities.

MINERAL ORDER(S): The proposed site is open to mineral entry.

ACCESS: Access to the proposed site is by boat or floatplane. A fifty-foot wide easement will be reserved to protect public access in accordance with 11 AAC 63.050(b)(6) and 11 AAC 51. Should an additional easement(s) be required for this proposal, it will be identified and addressed under the final recommendation section of this document.

SURVEY AND APPRAISAL:

SURVEY: A survey is not required by law before issuing a 10-year negotiated lease. However, the department has the right to require one in the future, at the applicant's expense, if boundary conflicts or disputes over acreage arise.

APPRAISAL: The Division of Mining, Land and Water has approved an administrative lease fee schedule for aquatic farm sites that meet the conditions listed within the schedule. The most current lease fee schedule will be used to establish the fair market rental each lessee must pay. The applicant has the option to have a site-specific appraisal done, at the applicant's expense, before the lease is issued, if he or she does not wish to use the fee schedule. If an applicant opts for a site-specific appraisal, the division-approved appraisal will establish the rental for the lease and the fee schedule will no longer be an option.

PUBLIC / AGENCY NOTICE AND COMMENTS: Public notice of the proposal has been sent to various newspapers, post offices, agencies, boroughs/cities, native corporations, villages, tribes, the general mailing list maintained by DNR, Fish and Game Advisory committees, and valid third party interests, including nearby existing aquatic farm lessees. Public and agency comments regarding the proposal are encouraged during the comment period beginning on

August 17, 2011 and ending at 5:00 p.m., Thursday, September 15, 2011. The final best interest finding will consider and address all comments related to the proposal that were submitted timely, either in writing or by oral testimony at a hearing. The final best interest finding will be available on or about October 10, 2011. Only those who provide written/oral comments during the comment period will be sent a copy of the final best interest finding and will be eligible to appeal. The final best interest finding will include an explanation of the appeal process.

Evaluation by the Alaska Department of Fish and Game

I. Physical and Biological Characteristics: Based on the information provided by the applicant on the site physical and biological characteristics, the proposed sites appear capable of supporting the farm activities proposed. Details listed for the proposed areas are summarized below.

Protection from Oceanographic and Atmospheric Extremes: The physical exposure notes from Alaska ShoreZone imagery mapped data¹ shows the area as “protected” defined as a maximum effective fetch of < or = to 10 km. The proposed support facility structures and nursery culture gear have a sound configuration and anchoring system and are comparable to existing farm gear used in Southeastern Alaska that can withstand ocean and atmospheric conditions.

Sufficient Environmental Conditions: The proposed aquatic farm operation project is in an area that appears to have sufficient water exchange, water temperatures, currents, salinity, and primary production to support an aquatic farm and maintain healthy environment for other marine organisms.

Sufficient Water Depth: No information was provided by the applicant on depth of gear and depth of water on Page 5, Part D. Site Suitability, for any parcels. It is unclear what the water depth is at any of the parcels based on the NOAA Chart 17324. **The applicant will need to provide this information to determine whether the water depth is sufficient to prevent gear from grounding and impacting the benthos under floating structures.**

Eelgrass and Kelp Beds Maintained: The Alaska ShoreZone imagery mapped data² shows no eelgrass in the proposed project area (Figure 1). No kelp beds were found in the area. If health and the abundance of either eelgrass or kelp beds in the area are not properly maintained and within the proposed farm site parcel areas, project modifications to the aquatic farm operations permit will be made to correct the condition.

¹ NOAA (National Oceanic and Atmospheric Administration), Fisheries, National Marine Fisheries Service. Alaska ShoreZone: Coastal Mapping and Imagery. <http://akr-mapping.fakr.noaa.gov/szflex/> (Accessed July 2011).

² NOAA (National Oceanic and Atmospheric Administration), Fisheries, National Marine Fisheries Service. Alaska ShoreZone: Coastal Mapping and Imagery. <http://akr-mapping.fakr.noaa.gov/szflex/> (Accessed July 2011).

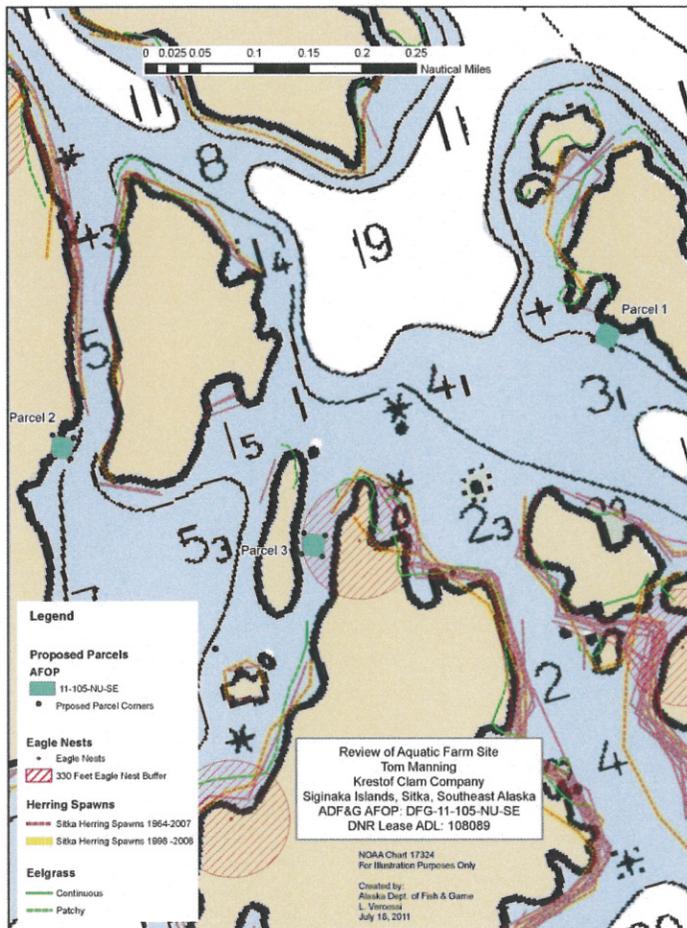


Figure 1. Vicinity of Eagle Nests, Herring Spawn, and Eelgrass near the Manning Proposed Site Parcels

Anadromous Fish Streams: The proposed project site is not located within 300 feet of the mouth of an anadromous fish stream catalogued by ADF&G for various salmon species³. The proposed farm gear structures will not significantly affect fish rearing habitats for salmonids and other marine fishes in the area and will allow adequate fish passage for salmonid adults (chum, coho, and pinks) that may be milling or migrating through the area.

II. Existing Uses not Significantly Altered: The proposed aquatic farm site will not significantly alter an established use defined in regulations as a commercial fishery, sport fishery, personal use fishery, or subsistence fishery.

³Johnson, J. and K. Klein. 2009. Catalog of waters important for spawning, rearing, or migration of anadromous fishes – Southcentral Region, Effective June 1, 2009. Alaska Department of Fish and Game, Special Publication No. 09-03, Anchorage.

Commercial Fisheries: The proposed aquatic farm is located in ADF&G Commercial Fisheries Division statistical area sub-district 113-40. The proposed aquatic farm site project is not expected to cause any significant alterations to the existing commercial fishery uses in the area. Details on each commercial fishery is listed below.

Geoducks: No commercial geoduck dive fishery takes place at the site. Southeast Association Regional Dive Fisheries Association (SARDFA) reconnaissance surveys found non-commercial concentrations of geoducks in the Siginaka Islands.

Sea cucumber: Commercial sea cucumber dive fishery landings took place in the area in 2010. However, the proposed project represents a tiny fraction of sea cucumber habitat and fishery area and the project structures and operation would not pose any significant interference to harvesting activities.

Red Sea Urchins: No commercial red sea urchin dive fishery takes place at the site.

Salmon: Commercial salmon fishery using purse seining (Chinook, sockeye, coho, and pink), hand trolling gear (Chinnok and coho) took place in 2010 in this area. No salmon set netting, power trolling, or gillnet salmon fishery occurred at the site in 2010.

Herring: The proposed site parcels for the floating nursery system for geoduck clams in Siginaka Islands are close to the core herring spawning area in Sitka Sound and the islands frequently receive some amount of spawn. ADF&G spawn data records show only one of the sites, Parcel 1, has received spawn in the past (Figure 1). No established commercial herring fishery occurs in this area.

Dungeness crab: There is no harvest data from statistical area 113-40 for commercial Dungeness harvest. Statistical area 113-40 is not part of the annual aerial survey so effort data can only be described for the statistical area itself, and not for any of the bays or inlets that are part of statistical area 113-40. It is likely that this proposed farm site will have no impact on commercial and personal use Dungeness fisheries, or on Dungeness habitat in the project area.

Sport Recreational Fishery: The area is not a significant site for Sport Anglers. Traditional troll and bottom fishing area for sport fishers is not known to occur in this area. Due to their design, oyster farms have not seemed to have significant negative impact on anglers. The proposed aquatic farm site is not expected to cause any significant alterations to the existing sport recreational fishery use.

Subsistence Use: The proposed aquatic farm site is not expected to cause any significant alterations to the existing subsistence use.

Anchorage: This area is not known to have any critical vessel anchorages. Parcel 1 and 2 are in areas that see some vessel traffic including high speed tour boats, and looking at the size of these structures it will likely impede boat traffic at Site 2. Boat

wakes at these sites may be of concern to the applicant.

III. Compatible with Fish and Wildlife Resources: The proposed aquatic farm site is compatible with fish and wildlife resources in the area.

Predator and Pest Control Methods: Predator exclusion devices to be used at the proposed site are expected to be utilized in a manner that minimizes impacts on non-targeted fish and wildlife resources in the area.

Sensitive Wildlife: The proposed aquatic farm site is not expected to adversely impact seabird colonies, sea lion haulouts and rookeries, seal haulouts and pupping areas, and walrus haulouts.

Sea Bird Colonies: There are no sea bird colonies identified within 1 mile of the proposed sites.⁴

Eagle Nest Habitat: Parcel 3 is within 330 ft of the base of a tree or structure that supports a bald eagle nest (Figure 1). If within site of an active bald eagle nest, no work rafts (FLUPSY nursery raft included), on which equipment is worked on shall be present and no equipment haulouts shall occur within 660 ft of the eagle nest. **ADF&G will not issue an operation permit for Parcel 3 as the placement of an aquatic farm site cannot be within 330 ft or if it can be seen from the site, 660 ft of an eagle nest.** This is necessary to adequately protect this resource⁵. The proposed aquatic farm project operations will significantly affect this resource in an adverse manner (5 AAC 41.250 (a)(6)). The applicant can propose to move the parcel outside of the 660 ft buffer. No eagle nests are near Parcels 1 and 2.

Sea Mammal Habitat: There are no sea mammal haul outs within 1 mile of the proposed sites⁶.

Endangered species: The proposed aquatic farm site will not adversely impact endangered and threatened species recovery and habitat efforts.

Invasive Species Management Practices: If the operation is approved, a permit condition will be drafted for the ADF&G operation permit that requires the permit holder to practice measures that reduce the risk of transferring an invasive species. In light of the recent invasive tunicate incidence isolated to the Sitka's Whiting Harbor, the extra measures are necessary to protect fish and wildlife and their habitat. An example of the permit condition follows:

⁴ U.S. Fish and Wildlife Service, (current year). Beringian Seabird Colony Catalog -- computer database. U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage, Alaska 99503.

⁵ U.S. Fish and Wildlife Service, Migratory Bird Management. Alaska Bald Eagle Nest Atlas-computer database. 2008.

⁶ Analysis completed by NOAA Fisheries Service, Alaska Region, Protected Resources Division. Specifically, the data used to complete this analysis were provided by researchers from NOAA Fisheries Service, Alaska Fisheries Science Center, and National Marine Mammal Laboratory.

Before any facility, equipment, or gear structures is moved to or from an aquatic farm site and another water body, the permit holder will be required to place the structures out of the water for a 48-hr drying period before any transfer takes place to reduce the risk of possible transference of exotic species.

IV. Operation and Development Plan:

Increase Productivity/Maintenance/Rotation Schedule: The operation and development plan is missing for this project.

V. Species to be Cultured and Site Suitability

The department has not conducted a site suitability study for this site. The applicant did not answer items 2, 4, 7, 8, 9, 10, 11, and 12 (depths in ft for the parcels) on Page 5, Part D. Site Suitability section. Based on general information on the area, the proposed parcels are probably capable of supporting the activities proposed. The proposed parcels in this aquatic farm operation project are located in an area that is thought to be suitable for culturing geoducks in a nursery setting.

VI. Request for Additional Information

The applicant needs to provide the following information:

- The applicant did not answer items 2, 4, 7, 8, 9, 10, 11, and 12 (depths in ft for the parcels) on Page 5, Part D. Site Suitability.
- Need applicant to submit an Operation and Development Plan, Part B. It is missing for this project.

ENVIRONMENTAL RISK ASSESSMENT: The applicant has submitted a signed environmental risk questionnaire. The questionnaire asks for information on potentially hazardous materials, such as plans for onsite storage of fuel or chemicals. The applicant has indicated that no on-site use, storage, transport, disposal, or otherwise, of any petroleum products will be used during the course of the proposed activities.

BONDING AND INSURANCE:

BONDING: Bonding, or another form of security, is required under AS 38.05.083 and 11 AAC 63.080. The bond must cover the costs of site cleanup and restoration, any associated cleanup costs after termination of the lease, including any unpaid rentals or other obligations accruing until site restoration is complete. The regulations require the minimum security amount of \$2,500 for an aquatic farm lease. Factors such as location and amount of improvements at the site are taken into consideration when the bond amount is determined. Please refer to the Recommendation section at the end of this decision for the bond amount that was determined appropriate for this proposal.

If three or more lessees post an association bond to cover all of their leases, the minimum security amount is 50 percent of the amount individually calculated for each

lease. The association must designate an agent for notification purposes. The association has the right to be notified of the termination of a lease covered by its association bond. If neither the former lessee nor the association completes the site restoration as required by AS 38.05.090, the department will use the association bond for this purpose, up to 100 percent of the amount individually calculated for that lease. The association may remove a lease in good standing from the coverage of its association bond after 60 days' notice to the department, during which time the affected lessee must make other arrangements to comply with 11 AAC 64.080(b). A lease that is in default or that has been terminated with site restoration still pending may not be removed from the coverage of an association bond.

INSURANCE: At this time the DNR does not require this type of activity to have general liability insurance. General liability insurance may be required in the future depending on the aquatic farming operations and the procedures of the department at the time changes are made to the lease or a renewal lease is issued. The lessee is responsible for acquiring other types of insurance, such as Workman's Compensation Insurance, that may be required under other local/state/federal laws.

POTENTIAL CONFLICTS AND PENDING / EXISTING THIRD PARTY INTERESTS: There are no known pending interests at the location of the proposal.

NORTHERN SOUTHEAST AREA PLAN INFORMATION SPECIFIC TO THIS PROPOSAL:

The proposal is located within the Southern Region – Admiralty, Baranof, and Chichagof and lies within the Sitka Sound Tidelands Resource Management Zones for Marine Waters and Tidelands. The tidelands are designated General Use (Gu). Land that contains one or more resource values, none of which is of sufficiently high value of merit designation as a primary use, or, because of the size of the parcel, a variety of uses can be accommodated with appropriate siting and design considerations. When specifically applied to tidelands, this would include tidelands, shorelands, and submerged lands not designated for specific, habitat harvest, economic, or recreation functions. This does not mean that the tideland or submerged land lacks value, but that the appropriateness of whether and how a tideland parcel is to be used will be decided through formal state and federal permitting procedures.

Most of the use of state lands within the region occurs on tide and submerged lands and includes fishing, subsistence, and hunting. Certain specific tideland areas have also been important as log transfer facilities, either for the Tongass National Forest or native corporations. Most of the commercial recreation is concentrated in the southern region and is mostly water-based with commercial operators mostly operating out of Juneau and Sitka.

All tide and submerged lands areas within the region are to be managed to ensure the continuation of community and commercial harvest, and subsistence. Essentially, all of the tide and submerged areas within the region are important at some time during the year for either commercial, community, or subsistence harvest.

The Northern Southeast Area Plan provides management policies and/or guidelines for major resources and several specific land management issues, including 1) aquatic farming 2) recreation, tourism, and scenic resources, 3) settlement, and 4) shorelines, stream corridors, and coastal areas. The plan states that it may be more difficult to site aquatic farms on

tidelands where there is, or proposed to be, waterfront development, high public use for tourism and recreation, anchorage, important habitat, or nearby residential development. However, the plan also states that these areas will be available for aquatic farming activities if the department determines in the best interest finding that (a) it is practicable to operate a farming operation so that it is compatible with the other uses of the immediate area and b) the proposed activity is consistent with all the other guidelines and management intents in the plan.

It is not known at this time where cultural/historic sites exist within this unit. DNR will consult with the Division of Parks and Outdoor Recreation, Office of History and Archaeology, with any recommendations included in the final best interest finding.

Upland Owner / Management Intent: The uplands adjacent to proposal parcels #1 and #2 are owned and managed by the Tongass National Forest. The uplands adjacent to proposal #3 are native owned and managed land belonging to the Haida Corporation.

CONSIDERATIONS: The following criteria set out in 11 AAC 63.050(b), has been considered and represents what is known at this time:

Land Management: There are no known land management policies or designations, other than those in the Alaska Coastal Management Program, City and Borough of Sitka Coastal District, and the Northern Southeast Area Plan, which may impact this proposal. Any measures taken to mitigate impacts on the resources identified in the above-mentioned plans are listed below.

Pending / Existing Uses:

1. There may be conflicts or potential impacts to nearby communities or residential land due to the proposed farmsite. Because the proposal is located within an area with a primary designation of Shoreline Development, it may not be possible to obtain the required water certification from the Department of Environmental Conservation (DEC) that is necessary prior to selling product. Therefore, this may not be an ideal location to place an aquatic farmsite.
2. Information available at this time suggests that the proposal at this location would not disrupt the traditional and existing uses of the site for use as an anchorage, commercial and sport fishing, recreation, and tourism.
3. There are no known cultural/historic areas in the area of the proposal. As stated above, the Division of Parks and Outdoor Recreation, Office of History and Archaeology, will be consulted, with any recommendations included in the final best interest finding.
4. There are no commercial or industrial facilities known to exist in the area.

Public Access: Public access will be protected in accordance with 11 AAC 63.050(b)(6) and 11 AAC 51 and will be addressed in any resultant lease agreement.

Public Trust Doctrine: The Public Trust Doctrine provides that public trust lands, waters and living resources in a state are held by the state in trust for the benefit of all the people, and establishes the right of the public to fully utilize the public trust lands, waters, and resources for a wide variety of public uses. Each state has the authority and responsibility for managing these public trust assets to assure the public rights are upheld.

The Public Trust Doctrine applies whenever navigable waters or the lands beneath those waters are altered, developed, conveyed, or otherwise managed. It also applies whether the trust lands are publicly or privately owned. Public trust lands are generally those lands below navigable waters, with the upper boundary being the ordinary high water mark. Tidelands, shorelands of navigable lakes and rivers, as well as the land beneath oceans, lakes and rivers are usually considered public trust lands.

All lease agreements are subject to the principles of the Public Trust Doctrine in order to protect the public's right to use navigable waters and the land beneath them for navigation, commerce, fishing, and other purposes.

Mitigation Measures: There doesn't appear to be any conflicts that would require mitigation measures.

If additional conflicts or potential impacts are identified during the public/agency comment period that can be mitigated by special stipulation(s), these special stipulation(s) will be included in the final best interest finding and any resultant lease agreement.

Social, Economic, and Environmental Concerns: There are no known significant social, economic, and environmental impacts from the placement of this proposal.

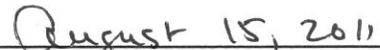
Surface Area: The proposal does not encumber more than a third of the surface area of a bay, bight, or cove in accordance with 11 AAC 63.050(c).

ADVANTAGES / DISADVANTAGES: A geoduck nursery operation could enhance the existing geoduck farm site by providing high quality geoduck seed that doesn't need to be shipped from the Alutiq Pride hatchery in Seward, AK. The nurseries may provide opportunities to increase income and diversify the state's economy by utilizing state tide and submerged lands for this purpose. The advantage of allowing this activity on state owned tide and submerged lands is the potential employment opportunities that may be available in the future when the farm starts to produce. In addition, secondary jobs may be created or increased from businesses involved in marketing and transport of the product.

The disadvantage of allowing this activity on state owned tide and submerged lands is the "privatization" or appearance of exclusive use of the area. The public may not be aware that uses protected under the Public Trust Doctrine remain intact.

RECOMMENDATION: Considering the information presently available, it is determined to be in the state's best interest to lease 0.99 acres to the applicants for placement of an aquatic farmsite. Any resultant lease agreement will include any stipulations identified above, any which may be required as a result of public comments, and any modifications necessary for consistency with the ACMP. Approval of the application is recommended with a security bond set at **\$2,500**.


John S. Thiede
Aquatic Farm Program Manager


Date

John Thiele

2678392
10/15/13

Project Description
Krestof Clam Company

Application for tidal Powered Floating Nursery System for Clam Mariculture in
Sitka/Krestof Sound, Alaska

This application is for a floating nursery system designed to acclimate and grow geoduck spat to planting size and condition for our geoduck farm in Krestof Sound. For the last three years we have been unable to obtain healthy geoduck seed from the Aluqtic Pride Shellfish Hatchery in Seward, Ak. The geoduck seed that has been available has proven to be too small and stressed to survive the planting process. Shellfish farmers in other regions, especially along the BC Canadian coast have been experimenting with different shellfish nursery systems. They have had success with different models but the floating system seems to be the only one likely to be permitted in the Sitka area. We applied several years ago for high-intertidal nursery system in Sitka Sound and were denied. The system we are applying to use is based on the model designed by the UGA Marine Extension Service. We have modified the design to allow for substrate filled trays required for geoduck seed.

There are several conditions we considered essential to the success of a tidal powered nursery system for our Krestof Sound Clam site:

1) Close proximity to the Sitka airport/road system.

Weather protected access at any season. Twice over the last several years our farm site in Krestof Sound has been inaccessible due to weather conditions when the geoduck seed arrived. The ability to coordinate shipment of seed from the Seward hatchery with good weather conditions in Sitka has been impossible. The shipment arrives on the late night plane, must be kept over night in trays and transported to the site the next day, weather permitting. A nursery system in closer proximity to Sitka would eliminate the delay and allow the geoduck seed to be quickly submerged into a controlled nursery environment. This would also allow the purchase of smaller, less expensive seed that are reported to survive the trauma of transport better than larger sized seed.

2) A location that offers protection from adverse weather conditions yet allows the required tidal flow. The system is designed to funnel tidal flow through the float, accelerating the natural feeding process similar to the powered paddle wheel system used in Oyster FLUPSY systems.

3) A location sufficiently away from freshwater streams or rivers. Geoduck seed and juveniles do not do well in low salinity areas.

We are applying for three sites within the Siginaka Islands group. The Siginaka islands are close to the boat launch at Stargavin Bay, far enough away from fresh water streams, close to the current/feed pull of Olga Strait and Nakwasina Sound and offer some degree of protection for the floats.

The nursery floats are identical; 12' X 28', (diagram/design plan attached).

The nursery system will be utilized for both short-term acclimation for larger seed and over winter nursery for small seed.



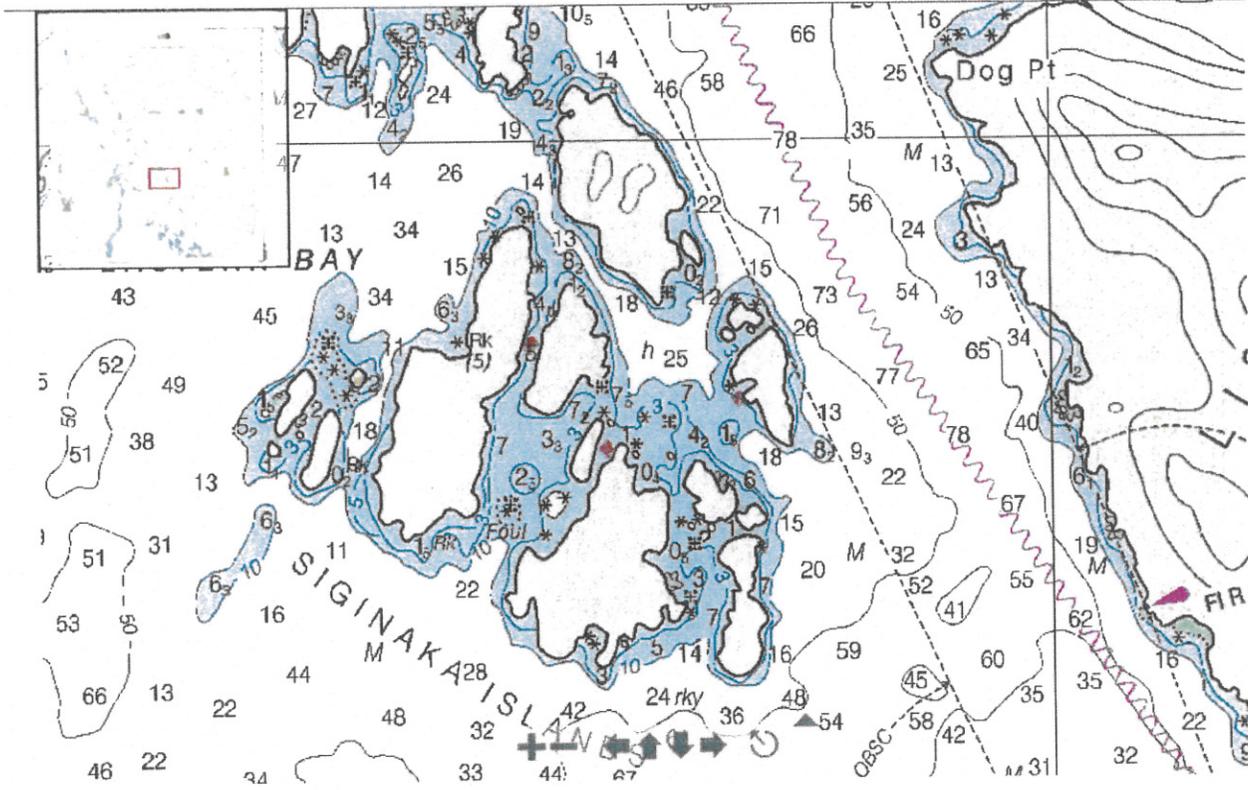
Produced by the United States Geological Survey 1975
 as modified by the United States Geological Survey
 as compiled by USDA Forest Service 1996

Topographic map compiled 1948. Planning data from 1997
 sources: Public Land Survey, 1997
 American Datum of 1927 (NAD 27). Projection and 20 000-foot ticks
 coordinate system, zone 1 (transverse Mercator)
 1000-meter Universal Transverse Mercator ticks, zone 8

SCALE 1:63 360

State
 National Forest, suitable
 for passenger cars
 National Forest, suitable
 high clearance vehicles

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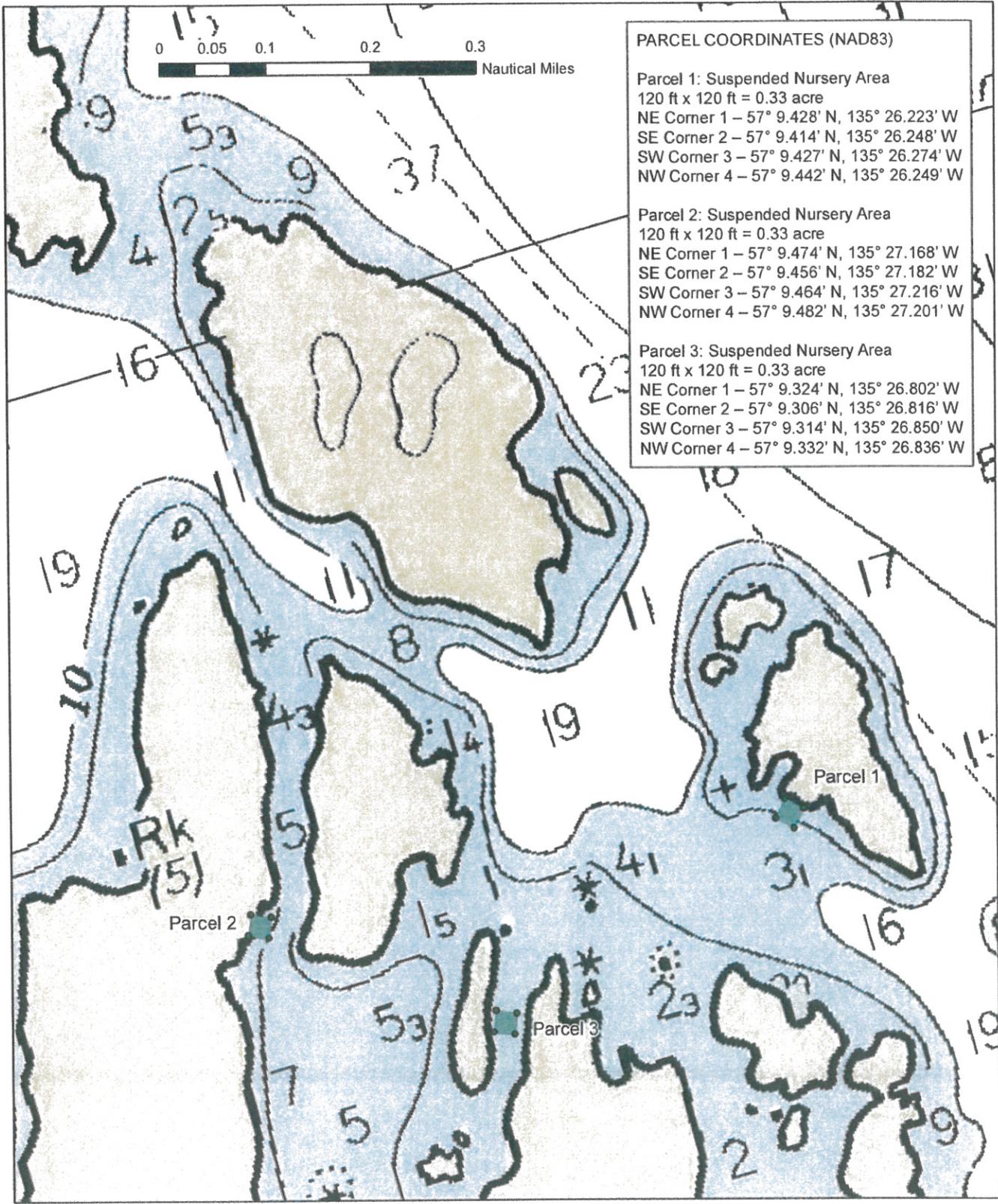
- Click the +/- buttons and drag the slider tool (solid triangle) to zoom in and out.
- Click the arrow buttons to pan left/right and up/down.
- Drag the navigation box in the upper left hand corner to move around the chart image.

This chart display or derived product can be used as a planning or analysis tool and may not be used as a navigational aid.

NOTE: Use the official, full scale NOAA nautical chart for real navigation whenever possible. These are available from authorized NOAA nautical chart sales agents. Screen captures of the on-line viewable charts available here do NOT fulfill chart carriage requirements for regulated commercial vessels under Titles 33 and 46 of the Code of Federal Regulations.

[Adobe Flash Player](#) is required to view the chart image.
Powered by [Zoomify](#).





PARCEL COORDINATES (NAD83)

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Legend

Parcel Corners
 ● 11-105-NU-SE

Parcels
 ■ 11-105-NU-SE

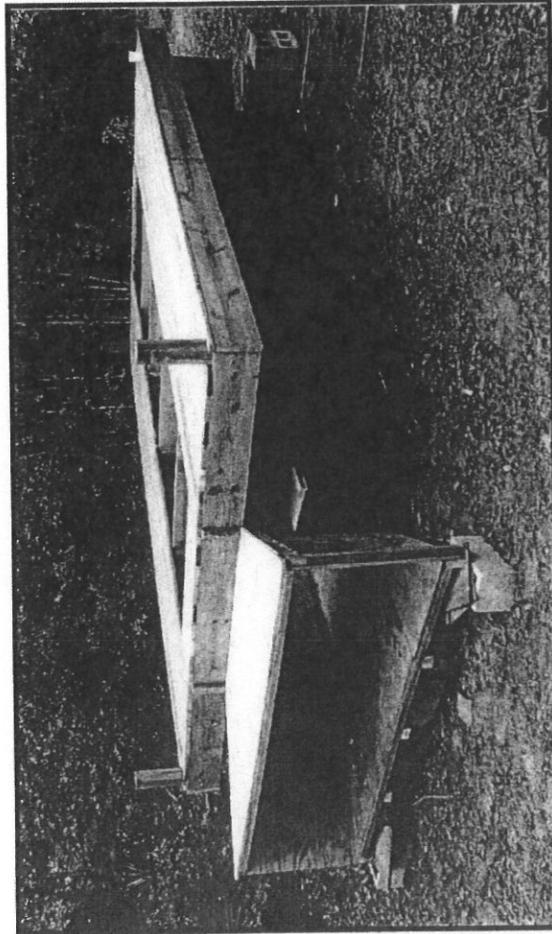
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 ADF&G AFOP: DFG-11-105-NU-SE
 ADNR Lease ADL: 108089

NOAA Chart 17324
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Tidal Powered Upwelling Nursery Systems for Clam Aquaculture in Georgia

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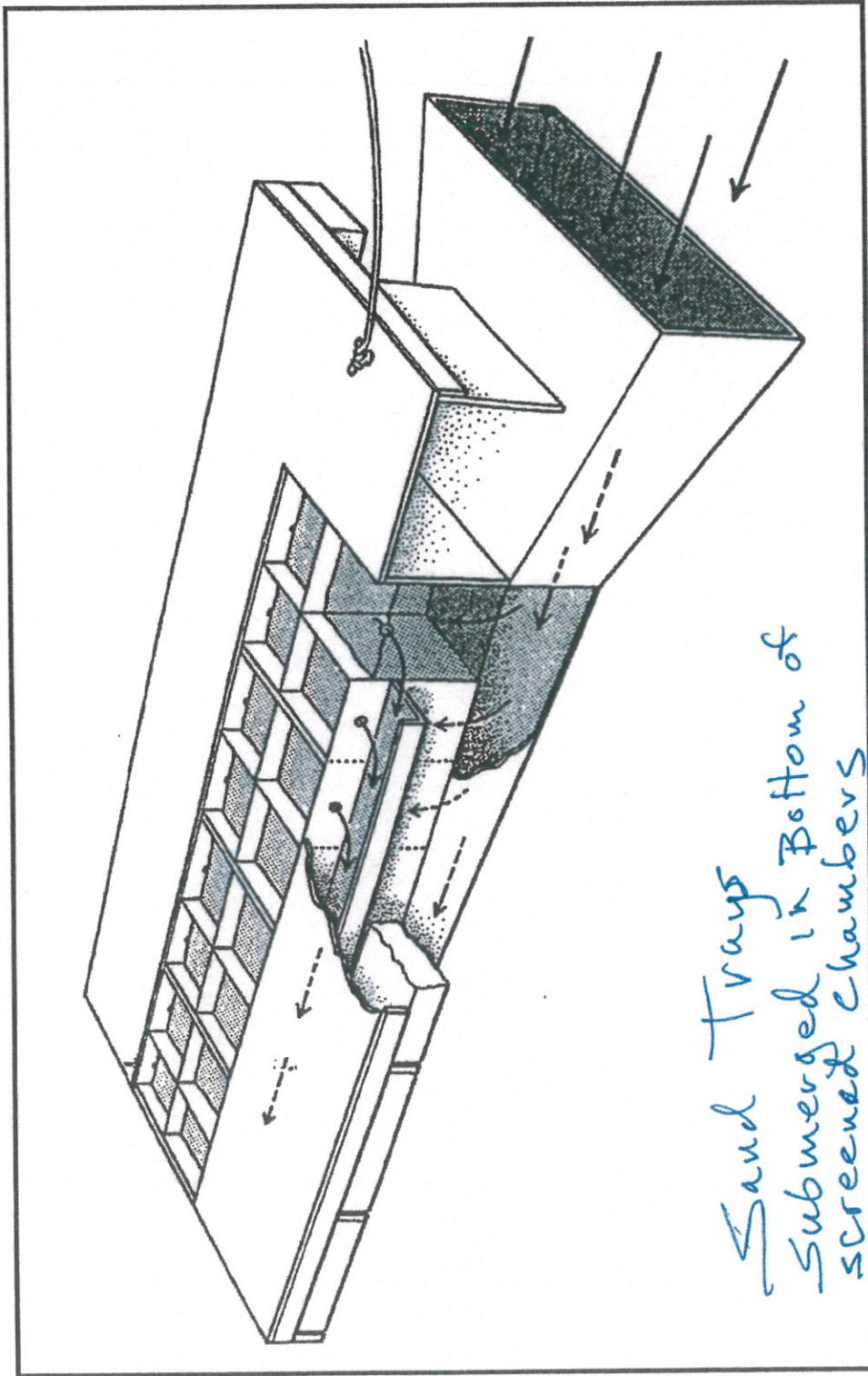


Fig. 1. Upweller design from Baldwin et al. (1995).