

STATE OF MAINE

DEPARTMENT OF MARINE RESOURCES

Standard Aquaculture Lease Application

Suspended & bottom culture of American & European oysters,

Goose Cove, Western Bay, Trenton

Acadia Sea Farms Inc.

Lease acronym BHB GC4

Docket # 2010-10

January 23, 2012

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION

Acadia Sea Farms, Inc., a Maine corporation, applied to the Department of Marine Resources ("DMR") on February 3, 2010, for a standard, ten-year aquaculture lease on 50 acres located in the coastal waters of the State of Maine, in Goose Cove in Western Bay in the Town of Trenton in Hancock County, for the purpose of cultivating American oysters (*Crassostrea virginica*) and European oysters (*Ostrea edulis*) using suspended and bottom culture techniques. DMR accepted the application as complete on May 13, 2010. Four parties intervened in this case: Friends of Goose Cove, Sheree Castonguay, Conrad Hoffman, and Friends of Blue Hill Bay. Public hearings on this application were held in Trenton on September 20, 21, 22 and December 1, 2010.¹ Written closing statements were filed by Acadia Sea Farms, Inc. and by the intervenor Friends of Goose Cove on January 10, 2011.

1. THE PROCEEDINGS

Notices of the hearing and copies of the application and DMR site report were sent to numerous state and federal agencies for their review, as well as to various educational institutions, aquaculture and environmental organizations, the Town of Trenton, members of the Legislature, representatives of the press, riparian landowners, and others on the Department's mailing list. Notice of the September hearing was published in the *Ellsworth American* on August 19 and Sept. 9, 2010 and in the *Commercial Fisheries News* September, 2010 edition. Notice of the December hearing was published in the *Ellsworth American* on November 18 and November 24, 2010 and in the *Commercial Fisheries News* December, 2010 edition.

Sworn testimony was given at the hearing by the following:

For the applicant: Gordon Longsworth, Warren Pettegrow, Wayne Hodgdon, Leslie Hogben, Mervin Roberts, Brian Beal, Elise Dana, and Robin Farrin.

For the Department of Marine Resources: Jon Lewis, Hannah Annis.

For the intervenor Friends of Goose Cove: Joseph DeAlteris, John Bennett.

For the intervenor Conrad Hoffman: Conrad Hoffman.

For the intervenor Sheree Castonguay: Sheree Castonguay.

¹ Total hearing time for this application was approximately 22 hours.

For the Town of Trenton: Julee Swanson.

For Acadia National Park: John Kelly.

For the All-American Roads Committee: Peter Lazas.

For the Bar Harbor Airport: Alison Navia.

Members of the public: Jane Disney, Janet Vitiello, Fred Stoddard, Bill Emery, Ryan Swanson, Linda Morin, Cathy Scarola, Julee Swanson, Martha Higgins, Bill Stockman, Michael Grunze. All except Dr. Disney are riparian landowners in Goose Cove.

Each witness was subject to questioning by the Department, the applicant, the intervenors, and members of the public. The hearing was recorded by DMR. The Hearing Officer was Diantha Robinson.

The evidentiary record before the Department regarding this lease application includes 34 exhibits introduced at the hearing (see the attached exhibit list), and the record of testimony at the hearing itself. The evidence from all of these sources is summarized below.²

Written closing statements were filed after the hearings on January 10, 2011 by the applicant and by the Friends of Goose Cove. The intervenor Friends of Blue Hill Bay did not participate in the hearings and provided no information or argument regarding the application, other than its application to intervene. Ms. Castonguay and Mr. Hoffman testified at the hearings but elected not to provide closing statements.

Official notice. In its closing statement, the applicant requests that the Department take official notice of two articles concerning oysters and ecosystems (Closing statement of Acadia Sea Farms, Inc., p. 8).³ Friends of Goose Cove objected to this request.⁴ DMR Rule Chapter 2.31 (2) allows the Department to take official notice of "general, technical, or scientific matters within the Department's specialized knowledge".⁵

² In references to testimony, "Smith/Jones" means testimony of Smith, questioned by Jones. The application, site report, and case file are cited as "A", "SR", and "CF" with page numbers or document references. All other exhibits are cited by exhibit number, unless otherwise indicated.

³ The applicant describes the article as "stating that several rehabilitation projects, such as those in the Chesapeake Bay and San Francisco Bay, have utilized oysters to clean the water." (Closing statement of Acadia Sea Farms, Inc., p. 8)

⁴ Friends of Goose Cove argues that "Rule 201 of Maine Rules of Evidence provides that a judicially noticed fact 'must be one not subject to reasonable dispute in that it is either (1) generally known within the territorial jurisdiction of the trial court or (2) capable of accurate and ready determination by resort to sources whose accuracy cannot reasonably [be] questioned.' The article complies with neither limb of the rule." Friends of Goose Cove request an opportunity to be heard "as to the propriety of taking judicial notice and the tenor of the matter noticed (M.R. Evidence 201(e))." (E-mail from Sally Mills to Diantha Robinson and Susan Hatton sent Tuesday, January 11, 2011 at 9:36 am, subject "RE: Acadia Sea Farms' lease application - closing argument.")

⁵ 2.31 Evidence

1. Evidence which is relevant and material to the subject matter of the hearing, and is of the type commonly relied upon by reasonably prudent persons in the conduct of their affairs shall be admissible. Evidence which is irrelevant, immaterial or unduly repetitious may be excluded. The Department's experience, technical competence and specialized knowledge may be utilized in the evaluation of all evidence submitted.
2. The presiding officer may take official notice of any facts of which judicial notice could be taken, and in addition may take official notice of general, technical, or scientific matters within the Department's specialized knowledge as well as statutes, regulations and non-confidential agency records. When facts are noticed officially, the presiding officer shall state the same during the hearing or otherwise notify all parties and they shall be able to contest the substance

The applicant's proposal is for the commercial cultivation of oysters in Goose Cove, not for the rehabilitation of the environment or the improvement of the water quality, although if the project goes forward, that could well be one result. Witnesses for the applicant, Friends of Goose Cove, and the Department all agreed about the ability of oysters to filter and clean the water in which they reside, as the testimony of Messrs. Beal, Roberts, DeAlteris, and Lewis shows.

The information and arguments presented in this case have focused mainly on the scale of the project and its potential effects on the uses of Goose Cove. Since the evidence already shows that oysters improve water quality, the information in the articles offered by the applicant is simply cumulative of the testimony of witnesses who have already testified and been subject to questioning on a topic that is not in dispute. Taking official notice of these articles would require notice to all the parties and possibly an additional hearing or other opportunity to argue the matter. The Department's time and resources are limited, and this exercise would not materially add to the information available to it in reaching a decision on this application. The request of the applicant for official notice of this material is therefore denied.

2. DESCRIPTION OF THE PROJECT

A. Site Characteristics

The proposed lease site is located in Goose Cove in Western Bay in the Town of Trenton, northwest of Mount Desert Island. It consists of two 25-acre rectangular tracts, one lying northwest-southeast off the eastern shore of the cove and one lying north-south off the western shore, separated by a minimum of 862 ft. of open water (SR6). The two tracts are not parallel to one another (SR Fig. 1).

Goose Cove is a wide, relatively shallow cove ringed by extensive tidal mudflats on the east, north, and west. To the southwest lies Alley Island, a privately-owned, undeveloped island which is under a conservation easement to Acadia National Park. The cove is open to the south and southeast, where water depths in Western Bay are significantly deeper.

The evidence shows that Goose Cove does not experience significant commercial fishing. Navigation is primarily seasonal and recreational, consisting mainly of small sail and power boats and particularly kayaks. The entire shoreline is developed for residential use, both seasonal and year-round. The peninsula of Haynes Point forms the east side of Goose Cove. East of Haynes Point, the highway leading from the mainland to Mt. Desert Island crosses the Trenton Bridge, which limits passage by sea around the north end of Mt. Desert Island into Western Bay.

or materiality of the facts noticed. Facts officially noticed shall be included and indicated as such in the hearing record.

Water quality. The area around the proposed lease site is currently classified by the Department's Water Quality Classification program as "open/approved for the harvest of shellfish" (SR8). An area at the head of the cove is polluted with fecal coliform bacteria and is closed to shellfish harvesting (Beal/Chapman). The site report states that Goose Cove is "typically free of red-tide" (SR8).

Physical characteristics. The site report describes the proposed lease site as follows:

The proposed lease site is located in the outer reaches of Goose Cove in between shallowing waters to the north, west and east. Both lease tracts are located over soft bottom with little change in topography. Small rock outcrops are located only in the northeastern portion of the easterly tract. Tidal flows are in a north-south direction depending upon tidal stage. Currents are moderate. (SR4)

East tract: Water depths within the east tract are approximately 19' at mean high water and 9.16' at mean low water (SR3). The site report notes that:

The eastern tract was flat (a consistent 15 feet deep) [at the time of the dive], and soft mud with only a rare rock outcropping near the northeastern corner. Divers were able to insert their arms into the soft sediments past their elbows without resistance. Past the northeastern corner, the sediments began to harden to a mix of mud and gravel. No eel grass was observed within the proposed lease boundaries. The first eel grass encountered was approximately 150 -200 feet outside the eastern boundary. (SR2)

West tract: Water depths within the east tract are approximately 20.3' at mean high water and 10.46' at mean low water (SR3). According to the site report:

The western tract was surveyed immediately after completing the survey on the eastern tract. Again, divers surfaced before each change in direction. Depths here were consistently 19 feet[at the time of the dive] and the bottom sediments were extraordinarily soft. Divers could insert their arms nearly to the armpit without resistance. Additionally, divers were able to insert their hands under the sediments and bounce the surrounding sediments within a six foot radius of their hands. No rock outcrops and no aquatic vegetation were observed. (SR2)

The report also notes that while the lease tracts are not expected to ice over heavily in winter,

...solid sheet ice would be anticipated at times. During prolonged cold periods ice may be continuous and thick enough to prohibit transit in all but the strongest boats. There may be nearshore shelf ice associated with shallow areas, and pan ice floating over the area from upper cove locations. Corner marker buoys would likely have to be reset in the spring as they would likely be moved by ice during the winter (SR8).

B. Proposed operations.

Warren Pettegrow, sole owner of Acadia Sea Farms, Inc., testified that he began planning the proposed oyster sea farm project in 2005. In 2009, he obtained a limited-purpose

aquaculture (LPA) license from the Department to raise oysters from seed in his family's lobster pound on the Skillings River in Lamoine, east of the Trenton Bridge. His family owns another lobster pound down east, which he testified he could also use for seed cultivation (Pettegrow/Chapman).

Mr. Pettegrow's experience includes 15 years working in the lobster business. He currently operates a 48-ft. lobster boat among the outer islands in the Mt. Desert area, buying lobsters and selling bait. He testified that he owns all the vessels he needs for the lease operation except a barge, which he will design and have built if the lease is granted. His lobster boat is moored in Northeast Harbor; it takes him 1.5 – 2 hours to go from his home near the proposed lease site in Trenton to the boat and bring the boat to the proposed lease site in Goose Cove (Pettegrow/Chapman).

Mr. Pettegrow said that he would also gain access to the Goose Cove site by launching a 22-ft. Boston Whaler at the nearby Bar Harbor Airport launching ramp in Mount Desert Narrows, east of the Thompson Island bridge. That fixed, low bridge limits navigation to three hours on each side of the average high tide, or six hours per tidal cycle (Pettegrow/Chapman). Once under the bridge, however, it is a short distance to the proposed lease site.

Mr. Pettegrow plans to begin work at the proposed lease site in the fall, placing juvenile oysters raised from seed in the pound over the summer into wire mesh cages which will be placed on the bottom of the lease tracts for the winter. In spring, the cages will be raised to the surface, hauled aboard a barge, and cleaned by pressure washing. The biofouling material cleaned off the cages will either be washed overboard into the waters of Goose Cove or collected on the barge and brought ashore to be composted at a land-based site. Harvesting will be done by hauling cages aboard the barge, sorting the oysters by size, placing smaller ones in cages and returning them to the bottom, cleaning the empty cages, and taking the market-sized oysters to shore (Pettegrow/Chapman).

Mr. Pettegrow testified that he will grow the oysters to market size "mainly" in cages on the bottom. He also stated that he wants to be able to place cages on the surface of the lease tracts for grow-out. As long as he can grow the seed initially in the lobster pound nursery, he said, he won't need to culture oysters at the surface, since they will grow large enough in the pound to survive their first winter on the bottom (Pettegrow/Mills). The application describes both bottom and surface culture methods (A11 & Exhibit C).

The cages Mr. Pettegrow plans to use will be a version of the "OysterGro" cage with larger-than-usual mesh size to reduce fouling. OysterGro cages measure 58" x 36" x 6"; two 58' x 11' x 8" hollow plastic flotation chambers lie parallel on the top. These chambers are left empty to provide flotation for cages at the surface; they can be filled with water to sink the cages to the bottom. A shelf inside enables the cage to hold two layers of three plastic mesh shellfish bags, or six bags per cage. Similar cages without floats will be used for bottom culture only, according to

Mr. Pettegrow. Bird deterrents will be used to prevent birds from roosting on the floating cages; these were developed in Canada (A, Exhibit C; Pettegrow/Chapman).

According to the application, at maximum capacity using surface cages, each tract will hold approximately 2,500 cages. These will be deployed in lines running parallel with the prevailing wind and with the long axis of each tract, 23 lines on the east tract and 19 lines on the west tract. Each line will consist of multiple strings of 10-12 cages arrayed end-to-end and anchored at the ends of the strings with 100-lb. mushroom anchors or 150-lb. concrete blocks.⁶ On the east tract, each line will include 10-11 strings of cages; on the west tract, each line will include 13-14 strings of cages. The cages in each string will be approximately 10 ft. apart; the lines of cages will be spaced 28 ft. apart (A, Exhibit C). Cages will be similarly deployed on the bottom but will not be anchored, relying on their own weight to hold them in place (Pettegrow/Chapman).

Mr. Pettegrow testified at the Dec. 1 hearing that he had reached an agreement with the National Park Service to deploy no surface gear on the southern one-third of the east tract, in order "to protect the public view from the Thompson Island bridge" (Pettegrow/Chapman).

Mr. Pettegrow calculated the minimum distance between the two lease tracts as 905 ft. He stated that the deepest part of Goose Cove would still be open to navigation, even with the cages in place. He noted that the bottom cages would rest in approximately 10 ft. of water at mean low tide (Pettegrow/Chapman). In the event of a hurricane, he would sink any surface cages if necessary, but he observed that Goose Cove is protected and would not be likely to experience large swells. He said that he has 10-15 employees at his family's lobster pound who could help sink surface cages in an emergency. The cages at the shallowest end of the east tract (north end) will be in 4 ft. of water at mean low water, and "any vessel could navigate over the cages there at mean low tide" (Pettegrow/Mills).

According to Mr. Pettegrow, he will develop the site to its full capacity over four to five years. In the first year, he will use one-quarter of the site with approximately 500 cages on both sites. Through experience at the site, he will determine the most effective density of oysters in the cages for optimum growth; larger oysters require more cages (Pettegrow/Mills).

Birds. Conrad Hoffman, an intervenor, testified that the proposed lease is aligned with runway #4 of the Bar Harbor Airport and is located within five miles of the farthest edge of the airport. If the lease site could cause wildlife movement through the arrival and departure airspace of runway #4, he said, the FAA would consider the proposed lease to be a "hazardous wildlife attractant" that could increase the potential for a plane using the runway to strike the wildlife (Hoffman, testimony). By "wildlife", in this case, Mr. Hoffman was referring to wild birds that he said might roost on the oyster cages if they were deployed at the water's surface and possibly fly up into the path of arriving or departing planes.

⁶ Dr. DeAlteris testified that the concrete blocks would be insufficient to hold the strings of oyster cages in place (DeAlteris/Mills).

Alison Navia, Manager of the Bar Harbor Airport, also explained that the Federal Aviation Administration (FAA) considers wild bird populations within five miles of an airport to be a potential hazard to air traffic at the airport. She noted that the FAA and the Bar Harbor Airport oppose the proposed lease out of concern that it will attract birds.

The Hearing Officer advised those in attendance that the Department believes it lacks jurisdiction to consider issues regarding the potential effect of birds at the proposed lease site on the operations of the airport. The Federal Aviation Administration participates in the review of the lease application conducted by U.S. Army Corps of Engineers. Concerns about the potential effect of the proposed lease operations on the airport are therefore being reviewed at the federal level and considered by the Army Corps in its decision whether to issue a permit to Acadia Sea Farms to place aquaculture gear in the waters of Goose Cove.

3. STATUTORY CRITERIA & FINDINGS OF FACT

Approval of standard aquaculture leases is governed by 12 M.R.S.A. §6072. This statute provides that a lease may be granted by the Commissioner of DMR upon determining that the project will not unreasonably interfere with the ingress and egress of riparian owners; with navigation; with fishing or other uses of the area, taking into consideration the number and density of aquaculture leases in an area; with the ability of the lease site and surrounding areas to support existing ecologically significant flora and fauna; or with the public use or enjoyment within 1,000 feet of beaches, parks, docking facilities, or conserved lands owned by municipal, state, or federal governments. The Commissioner must also determine that the applicant has demonstrated that there is an available source of organisms to be cultured for the lease site; that the lease will not result in an unreasonable impact from noise or lights at the boundaries of the lease site; and that the lease will be in compliance with visual impact criteria adopted by the Commissioner relating to color, height, shape and mass. Each of these statutory requirements is described in more detail in rules adopted by the Department, which are included as footnotes in each of the subsections below.

A. Riparian Access⁷

As discussed under Site Characteristics, above, Goose Cove is a long, broad, shallow cove edged with extensive tidal mudflats. The upland shore of the cove is ringed with houses, many of which sit atop steep banks above the flats. Presumably as a result of this topography, there are no docks or piers in Goose Cove within 1,000 ft. of the proposed lease tracts.

The site report states that:

If the lease were granted there would be a minimum of 500 feet between the eastern tract and Haynes Point, 860 feet between the two lease tracts and 300 feet between the western tract and Alley Island. Due to the shallow nature of Goose Cove most navigation would likely be landowners in shallow draft vessel[s] seeking access to their properties and moorings further inside the cove (SR6).

The site report also lists the distance to shore from the western boundary of the west tract to the "nearest mainland intertidal" [i.e., the western shore of Goose Cove] as 1,384 ft. (SR6).

Mr. Pettegrow testified that the proposed lease will not interfere with riparians' access to and from their properties by water, because the mudflats around the cove's perimeter already limit access. Riparians can gain access to their shore by boat around the lease sites at high tide, but not at low tide, he said (Pettegrow/Chapman).

Mr. Roberts also testified that the mudflats currently limit riparian access to shore at low tide. He said that there is "plenty of room" between the lease tracts and the shore and between the lease tracts for navigation and noted that Goose Cove will not be filled with cages (Roberts/Chapman).

Mr. Stockman testified that large boulders lie along the outer edge of Goose Cove and impair navigation between the lease tracts and the shore (Stockman, testimony).

Mr. Hoffman was the only witness who described his use of the shore for ingress and egress by boat. At one time he hauled a small boat to and from the water across 200 ft. of mudflats, using a two-wheeled trailer and "brute force" (Hoffman/Roberts). The last time he did this, however, was in 1988.

Boat access to shore in Goose Cove is likely to be very difficult at low tide, with or without the lease sites, because of the shallow water and broad mud flats. It has been more than twenty years since Mr. Hoffman used a trailer to haul his boat across the flats, and no one else offered similar testimony. The water is too shallow and the distance to shore too great for people to cross at low tide to get to shore.

⁷ Chapter 2.37 (1) (A) of the DMR rules elaborates on the statutory language as follows:

2.37 (1) (A) (2) (1). Riparian Owners Ingress and Egress. The Commissioner shall examine whether the riparian owners can safely navigate to their shore. The Commissioner shall consider the type of shore involved and the type of vessel that can reasonably land on that shore. He/she shall consider the type of structures proposed for the lease and their potential impact on the vessels which would need to maneuver around those structures.

At high tide, however, the evidence shows that the shore is accessible by boat. While there would be adequate space between the lease tracts and the shore to reach the shore by boat at higher tidal stages, the presence of the lease tracts, if filled with gear as proposed in the application, would hinder such access in two ways. First, as long 25-acre rectangles filled with gear and mooring lines, they would hamper the passage of motor and sail boats across them, both because of lack of space to maneuver and because of the risk of tangling in gear and mooring lines. Second, the tracts are over a quarter of a mile in length, so they present significant obstacles for small boats, particularly those without motors, to navigate around in order to reach the shore on the other side. These small craft would be forced to travel a significant distance to get around each lease tract in order to reach the shore beyond.

Both of these effects constitute unreasonable interference with riparian ingress and egress, but this situation can be mitigated by the establishment of navigation corridors, as described in the following section under Navigation.

Therefore, I find that the aquaculture activities proposed for this site will not unreasonably interfere with the ingress and egress of any riparian owner, provided that navigation corridors are established and maintained on the lease tracts as described under section 3 (B) on Navigation, below.

B. Navigation⁸

The Friends of Goose Cove in their closing statement contend that “navigation” in the statute and DMR rules should be read to include airplane navigation (FOGC closing statement p. 8). Nothing in the language of the statute or the DMR rule (see footnote 8, below) supports this argument. As noted above, the effect of the proposed lease on airplane traffic is being considered in the course of the federal agency review of the application that is conducted by the U.S. Army Corps of Engineers.

Navigation in Goose Cove. The Department sent a Harbormaster Questionnaire to the Town of Trenton. Because the town does not have a harbormaster, it referred the questionnaire to the Bar Harbor Harbormaster, Charles Phippen, who responded in writing. Mr. Phippen observes that the main route for navigation is “generally in a Northeast/Southwest direction from the deep water off the southern shoal on Alley Island to the Mount Desert Narrows leading to the Trenton Bridge.” He notes that this is south of the proposed lease tracts and would

⁸ Chapter 2.37 (1) (A) of the DMR rules elaborates on the statutory language as follows:

2.37 (1) (A) (2) Navigation. The Commissioner shall examine whether any lease activities requiring surface and or subsurface structures would interfere with commercial or recreational navigation around the lease area. The Commissioner shall consider the current uses and different degrees of use of the navigational channels in the area in determining the impact of the lease operation. For example: A lease area adjacent to the usual course of a barge in tow shall be held to a stricter standard than one in an area frequented by only outboard skiffs. High tide “short cuts” shall not be considered navigational ways for the purposes of this section.

be roughly 500 yards away from any floating cages. North of this route, he says, boat traffic is primarily "vessels accessing properties along the Goose Cove shore", for which the oyster cages

...would be a navigational impediment for north/south vessel traffic transiting from Goose Cove to the Northeast/Southwest route described above. The deep water which runs in a northwesterly direction into the mouth of Goose Cove appears to be unobstructed by the proposed float systems, however the obstructions would be in close proximity to this course. There is concern that navigation in this area during periods of low visibility and darkness would be dangerous unless there were lights and radar reflectors to indicate the location of the obstructions (SR7).

As the site report notes, lessees are required to apply to the United State Coast Guard, Office of Private Aids to Navigation to determine the need for lights and/or radar reflectors at lease sites.

The site report states:

The primary navigational channel into Goose Cove is located in the middle of the cove as depicted on nautical charts. This is not a marked channel and currently vessels are free to navigate throughout the cove. If the lease were granted there would be a minimum of 500 feet between the eastern tract and Haynes Point, 860 feet between the two lease tracts and 300 feet between the western tract and Alley Island. Due to the shallow nature of Goose Cove most navigation would likely be landowners in shallow draft vessel seeking access to their properties and moorings further inside the cove. The shallow nature of the cove combined with oversight from local landowner properties likely makes this a popular local kayaking and boating area for the residents of Goose Cove (SR6).

Mr. Lewis testified that while a 45' sailboat would have room to tack back and forth in the open area between the lease tracts, the shallow water depths in Goose Cove limit navigation by larger vessels. He noted that his tacking calculation assumed only one boat in the vicinity at a time. Navigation in the space between the leases would be complicated by the presence of multiple boats in the area at the same time or by the presence of vessels moored between the lease tracts (Lewis, testimony). If cages were placed on the bottom, he said, sailboats that did not have deep drafts could navigate over them (Lewis/Mills).

Mr. Hoffman testified that the two lease tracts would occupy 23% of the area of the cove below the 5-ft. depth contour. In the past, when he sailed a small boat in the cove, he said, it drew 4' 2" of water, and he "would have preferred six feet". A sailboat with a 4-ft. draft would hit bottom cages at low tide, he said, just as they would hit lobster traps, which are the same height under water. He noted that there was ample room to tack a sailboat between the tracts and that a motorized sailboat could navigate between the tracts under power, if necessary (Hoffman, testimony).

Mr. Pettegrow, Ms. Hogben, and Mr. Roberts testified that boats could navigate between the proposed lease tracts. Ms. Hogben noted that the primary limitation on sailboats in Goose

Cove is the depth of the water and the draft of the boat, not the width of the channel (Pettegrow/Chapman, Hogben/Chapman Roberts/Chapman).

Dr. DeAlteris testified that the "navigable water" in Goose Cove is outside the 6-ft. depth contour and that the leases would occupy half of that area. Sailboats could not navigate through floating oyster cages, he said, although kayaks could. He noted that placing the cages on the bottom would mean that navigation would be largely unimpeded (DeAlteris/Mills).

Mrs. Castonguay testified that if the lease were granted, it would mean that no one could navigate in Goose Cove without interference from the lease activities (Castonguay, testimony).

Mr. Stockman testified that navigation inside Goose Cove consists more of boats traversing the cove from east to west than from north to south. Kayaks and other small boats travel back and forth between the Indian Point campground and Alley Island to visit the beaches or navigate between Alley and the west shore. In his view the north-south center channel between the lease tracts is not helpful for these types of navigation, because the gear on the lease tracts to the east and west would block such navigation across the cove. He also observed that most boats operating in Goose Cove are kayaks and canoes that need to deal with tides, currents, and wind without motors to assist them (Stockman, testimony).

Ms Dana, a kayak guide, testified on behalf of the applicant that she believed the lease would not interfere with kayaking and that kayaking tourists would find the oyster farm interesting (Dana/Chapman).

Michael Grunze testified that sailing a small boat off his shore on the west side of the cove would be impossible with floating cages on the lease tracts because of the danger of hitting cages and tangling the cage moorings (Grunze, testimony).

Numerous riparian landowners from Goose Cove testified to their use of the cove for bird-watching, boating, swimming, fishing, wind surfing, and as a protected area for children in small boats (Janet Vitiello, Fred Stoddard, Bill Emery, Ryan Swanson, Linda Morin, Cathy Scarola, Julie Swanson, Martha Higgins, Bill Stockman, and Michael Grunze).

Based on the evidence, it appears that the navigation route to the south of Goose Cove, running northeast/southwest from south of Alley Island to the Trenton Bridge as Mr. Phippen described, would not be significantly affected by the presence of oyster gear on the proposed lease tracts, whether floating or on the bottom.

Navigation within Goose Cove to the north of this route, and particularly across the cove from east to west, however, would be affected. The open space that the applicant proposes to leave between the two lease tracts would primarily benefit boat traffic heading north-south into and out of the cove.

The proposed lease tracts lying to the east and west of this central open area are each well over one-quarter of a mile in length. They would present significant barriers to the movement of vessels across the cove from east to west if filled completely with continuous lines of oyster cages and mooring gear as depicted in the application. The primary vessels using Goose Cove are

smaller, human-powered craft such as kayaks, canoes, and small sailboats, all of which must reckon with the forces of tides, currents, and winds. For such vessels, the floating gear as proposed would constitute a significant impediment to navigation across Goose Cove. Without some mitigation, that impediment would constitute unreasonable interference with navigation.

Condition: navigation corridors required. Therefore, a condition will be placed on this lease in order to ensure that navigation across the cove from east to west can continue without unreasonable interference. The applicant will be required to maintain two navigation corridors on each lease tract, located approximately one-third of the way north from the south end of each tract and a similar distance south from the north end of each tract. The corridors are to be a minimum of 250 ft. in width from north to south and must constitute clear paths across each tract free of all floating and bottom gear, including mooring gear, moored boats, and work platforms, so that vessels can navigate across each tract unimpeded by aquaculture gear. Each corridor must be marked with floating buoys at each corner containing the words "Area open to navigation" in letters at least two inches high. Before the Department will execute a lease, the applicant must submit a revised gear plan for the lease tracts demonstrating to the Department's satisfaction the location of these mooring corridors, including compass coordinates.

Moorings. The site report describes moorings in Goose Cove on June 30, 2010 as follows:

No moorings were observed within the boundaries of the proposed lease site. Most moorings would be nearer to shore and likely deeper into the cove than where the leases are proposed. There are a number of moorings inside Goose Cove. The nearest mooring we observed was more than 2,000 feet away from the nearest lease boundary. While on site, we received a report that a mooring sometimes was in place just to the east of the eastern tract. This would place that mooring approximately 400-500 feet from proposed lease. We did not observe this mooring on June 30, 2010. It is likely that some moorings were not yet "in-place" at the time of our visit (SR7).

Mr. Lewis testified that the U.S. Army Corps of Engineers does not recognize moorings unless they are registered either with the town in which they are located or with the Army Corps. The Town of Trenton does not have a Harbormaster or a mooring ordinance, so no moorings are registered with the town. The Army Corps informed the Department that no moorings in Goose Cove were registered with it at the time Mr. Pettegrow applied for the lease, although the Corps received several applications for mooring permits subsequent to the lease application. The Corps processes such applications according to date of receipt, so it will consider the Goose Cove mooring applications after Mr. Pettegrow's application for a Corps permit is decided upon.

Testimony from various witnesses indicated that a number of moorings are placed in Goose Cove.

Mr. Grunze, a riparian owner of land on the west side of the cove, testified that his mooring for a 45' sailboat is located within the proposed western lease tract, and his small boat mooring is located to the west of the west tract. He noted five other moorings in the area, two

others in the west tract, two between the tracts, and one to the north of both tracts (Grunze, testimony).

Mr. Hoffman presented Exhibit 26, showing five moorings in the cove located as Mr. Grunze described, except that only Mr. Grunze's mooring was shown within the west tract. Both Mr. Hoffman and Mr. Grunze noted that space for moorings in Goose Cove is primarily seaward of the 5-ft. depth contour.

Mr. Lewis testified that the limited time window for boat access to the proposed site via the Trenton Bridge effectively means that to work an 8-hour day at the site, the applicant would need to moor a vessel permanently in Goose Cove. In fact, the applicant's closing statement closing notes that because of these access limitations, he will moor a barge at the lease site during cleaning operations (closing statement of Acadia Sea Farms, p. 8).

Given the amount of space the proposed lease tracts would occupy in the limited area of deeper water in Goose Cove, the presence of lease-related vessels, whether moored or under way, outside the lease boundaries would restrict the ability of other vessels to navigate there, according to Mr. Lewis (Lewis, testimony). He expects that the 16-20 ft. skiffs that will be used at the site are likely to work in part along the perimeter of the lease tracts, outside the lease boundaries, in order to gain access to the cages moored along the edges of the tracts (Lewis/Swanson). A work barge or other lease-related vessels moored outside the lease boundaries could also hamper navigation in the area (Lewis/Mills).

Mr. Stockman testified that the proposed lease tracts take up the "most ideal areas" for moorings, which are seaward of the 5-ft. depth contour in the areas just north of the north end of the west tract and west of the north end of the east tract. With floating gear deployed on the lease tracts, he said, access to and from these mooring areas will be more difficult, as boats will have to navigate around the gear to reach the moorings.

Mr. Hoffman testified that sailing between the lease tracts would be difficult if a work barge and skiffs were moored there. He asked where moorings could be placed if the lease tracts occupy all the deeper water and noted that the farther away from shore moorings are placed, the longer it takes to row back.

Mr. Grunze testified that when he first brought his 45' sloop into Goose Cove, he anchored it. The bay can be violent, he said, when winds blow from the southwest or the north, and his 50-lb. anchor dragged. Now his mooring consists of two mushroom anchors, one 70 lbs. and one 100 lbs., attached with chain. He sinks the chain and anchor gear to the bottom in winter because the cove ices over. The mooring is located inside the west tract of the proposed lease, in the northwest corner. He reaches it by sailing north along Alley Island, because rocks impede the passage to the west of the mooring. Mr. Grunze testified that he cannot sail west of the west tract in his larger boat or in any boat with a draft of more than 4-5 ft.; his sloop draws 11 ft. (Grunze, testimony).

Mr. Grunze testified that access under sail to his mooring at the northwest corner of the west lease tract would be difficult or impossible with either floating or bottom gear deployed on the west tract. Without the lease and gear in place, he would simply sail straight to his mooring, across the site of the proposed west tract. His boat's draft is too deep to allow it to sail west of the lease tract to reach his mooring. The water to the north of his mooring is not deep enough over a wide enough area to allow him to sail to the mooring by navigating between the two tracts and around the north end of the west tract. Like the other residents of the cove, he said he was unaware of the requirement to register moorings with the U.S. Army Corps of Engineers (Grunze, testimony).

Mr. Grunze has a second mooring for a small sailboat for his children, located slightly northwest of the west tract. He testified that the presence of the lease and gear would preclude his use of this mooring because of the danger of the boat hitting the cages or tangling the cage moorings. Development of the lease site as proposed would change the way he uses Goose Cove from his land (Grunze, testimony).

It is apparent from the evidence that some riparian landowners have maintained moorings in Goose Cove which could be formally permitted by the Army Corps. Many of these riparians have now applied to the Corps for mooring permits. At least one permanent mooring as now located (Mr. Grunze's) would have to be moved to accommodate the proposed western lease tract, if it were approved. This amounts to an unreasonable interference with navigation in Goose Cove. This interference can be mitigated, however, by imposing the following condition on the lease.

Condition: Existing moorings. All gear and equipment must be kept sufficiently far away from existing moorings so as not to interfere with their use.

The area of deeper water in Goose Cove where moorings can be placed and where navigation can occur is limited, particularly for larger or deeper-draft vessels. Granting the proposed lease would reduce this area substantially, making it more difficult to navigate or moor a boat there. In addition, skiffs tending cages along the outer edges of the lease tracts and a work barge or other lease-related vessels moored outside the lease boundaries would further reduce space for both future moorings and navigation. This amounts to an unreasonable interference with navigation in Goose Cove. This interference can be mitigated, however, by imposing the following conditions on the lease.

Condition: Mooring, anchoring, and site work restricted. Between May 1 and October 30 of each year, all work on the lease site must be conducted within the boundaries of the site, and all vessels, barges, rafts, work platforms, and other floating craft or gear associated in any way with the lease operations must be anchored or moored within the boundaries of the lease. Site work, anchoring, and mooring must not impede the transit of vessels through the navigation corridors required to be established on the lease tracts.

The leaseholder must mark the site in accordance with U. S. Coast Guard requirements.

Therefore, I find that the aquaculture activities proposed for this site will not unreasonably interfere with navigation, provided that the site is marked in accordance with U.S. Coast Guard requirements, that navigation corridors are maintained as described above, that all gear and equipment are kept sufficiently far away from existing moorings so as not to interfere with their use, and that limitations on moorings and site work are observed as described above.

C. Fishing & Other Uses⁹

The site report indicates that

On June 30, 2010 no lobster traps were observed within the boundaries of the proposed lease. Two lobster buoys (red/yellow/green striped) were observed from the surface nearby and just to the north of the proposed boundaries. We observed one angler casting a line from a small recreational boat with what appeared to be two aboard. Interviews with the local Marine Patrol Officer indicated lobstering activity “might” increase as the summer progresses. While on site we were told by a local landowner that, historically, herring stop-seining has occurred in the area (although not necessarily within the proposed lease boundaries) (SR5).

Mr. Pettegrow, a commercial lobsterman who lives in the area, testified that lobstering in Goose Cove is “minimal” and that the oyster cages will not interfere with fishing. He said the presence of the cages will make the site “no different than a highly-used harbor”, noting that he often sees seals, herring, porpoise, and mackerel in the vicinity of mooring fields in harbors (Pettegrow/Chapman).

Dr. Beal testified that there is little fishing in Goose Cove and very few lobster traps, even in the “shedder” season, when “you would expect to see some” (Beal/Chapman). Mr. Roberts said there are not enough herring in Goose Cove to be affected by the proposed lease operations and that the lease would not have any effect on fish or seals in the cove (Roberts/Chapman). Mr. Lewis noted that the water depth over any bottom cages would be too shallow to permit fishing without the fishing gear tangling in the oyster cages.

As noted above, there are extensive mudflats around the cove, some of which are closed to commercial shellfish harvest because of pollution. There is no evidence showing that the lease

⁹ Chapter 2.37 (1) (A) of the DMR rules elaborates on the statutory language as follows:

2.37 (1) (A) (3) Fishing. The Commissioner shall examine whether the lease activities would unreasonably interfere with commercial or recreational fishing or other water-related uses of the area. This examination shall consider such factors as the number of individuals that participate in recreational or commercial fishing, the amount and type of fishing gear utilized, the number of actual fishing days, and the amount of fisheries resources harvested from the area.

2.37 (1) (A) (4) Other Aquaculture Uses. The Commissioner shall consider any evidence submitted concerning other aquaculture uses of the area. The intensity and frequency of such uses as well as the degree of exclusivity required for each use shall be factors in the Commissioner's determination of whether any interference is unreasonable. The number, size, location, and type of other aquaculture leases shall be considered by the Commissioner.

activities will interfere with shellfish harvesting, particularly since the lease tracts are located far from the flats.

Taken together, the evidence indicates that there is very little fishing activity, recreational or commercial, in Goose Cove. There is no evidence that the presence of the proposed aquaculture lease site will interfere significantly with fishing.

Other uses. Riparian landowners from Goose Cove testified to their use of the cove for bird-watching, boating, swimming, fishing, wind surfing, and as a protected area for children in small boats (Janet Vitiello, Fred Stoddard, Bill Emery, Ryan Swanson, Linda Morin, Cathy Scarola, Julie Swanson, Martha Higgins, Bill Stockman, and Michael Grunze). Mrs. Castonguay testified that in her opinion the lease operations would interfere with swimming in the cove.

Issues regarding the removal of biofouling will be addressed below in section 3 (D), Flora & Fauna. Boat-related uses of the cove are addressed in section 3 (B), Navigation, above. While a few people expressed concern that there would be fewer species of birds to watch in Goose Cove if the lease is operated there, there is no evidence from which to predict whether this is likely to occur.

Other aquaculture leases. According to the site report,

The nearest aquaculture lease sites in proximity to the proposed lease are BHB GC 1 through 3. These are three contiguous 1.99 acres [*sic*] lease sites for the culture of hard clams (*Mercenaria mercenaria*) and are leased by Joseph Porada under the State's Limited Purpose Aquaculture (Experimental lease) Leasing Program. These three leases are due to expire on April 30, 2011 and are located approximately 2,489 feet from the proposed eastern tract being evaluated in this report.¹⁰

Dr. Beal, who also works with Mr. Porada on the experimental lease project, testified that Mr. Pettegrow's oyster lease would have no effect on Mr. Porada's lease for growing quahogs (hard clams). Oysters feed on smaller food particles than quahogs do and therefore will not interfere with quahogs' food supply, according to Dr. Beal (Beal/Chapman).

Exclusivity. In answer to the request to "describe the degree of exclusive use required by the proposed lease and the impact on existing or potential uses of the area", the application states: "During the use of floating cages, boat traffic would be able to travel between the strings of cages on the lease area and when cages are on bottom, boats could travel over them" (A16).

Condition: other uses permitted. Based on the evidence about other uses of the area and in light of the Department's experience with similar leases, it appears that small-boat navigation and recreational fishing can be allowed within the open areas of the lease site. Dragging should be prohibited in order to avoid conflict with the aquaculture gear.

¹⁰ Since the site report was written, Mr. Porada has applied to the Department to renew these leases, and that application is currently pending.

The lease boundaries must be marked in accordance with DMR Rule 2.80.¹¹

Therefore, considering the number and density of aquaculture leases in the area, I find that the aquaculture activities proposed for this site will not unreasonably interfere with fishing or other uses of the area. Small-boat navigation and recreational fishing will be allowed within the open areas of the lease site. Dragging will be prohibited in order to avoid conflict with the aquaculture gear. The lease must be marked in accordance with DMR Rule 2.80.

D. Flora & Fauna¹²

Copies of the application were provided to the Maine Departments of Environmental Protection and Inland Fisheries and Wildlife for review, but no comments were received from either agency. The site report notes that

According to the Maine Department of Inland Fish and Wildlife E-mail of January 6, 2010, provided with the application, their database contains no records of occurrence of any State-listed Endangered, Threatened, or Special Concern species or their habitats, including no Essential Habitats at this location (SR7).

The site report notes that no submerged aquatic vegetation (i.e., eel grass) was observed within the boundaries of the proposed lease tracts. According to the site report, "The first eel grass encountered was approximately 150 – 200 feet outside the eastern boundary" [of the east tract] (SR4). Mr. Lewis testified that coverage of eel grass in this particular area was in the range of 10-40% and extended for about 1,500 ft. along the east side of the east tract (Lewis, testimony).

¹¹ **2.80 Marking Procedures for Aquaculture Leases**

1. When required by the Commissioner in the lease, aquaculture leases shall be marked with a floating device, such as a buoy, which displays the lease identifier assigned by the Department and the words SEA FARM in letters of at least 2 inches in height in colors contrasting to the background color of the device. The marked floating device shall be readily distinguishable from interior buoys and aquaculture gear.
2. The marked floating devices shall be displayed at each corner of the lease area that is occupied or at the outermost corners. In cases where the boundary line exceeds 100 yards, additional devices shall be displayed so as to clearly show the boundary line of the lease. In situations where the topography or distance of the lease boundary interrupts the line of sight from one marker to the next, additional marked floating devices shall be displayed so as to maintain a continuous line of sight.
3. When such marking requirements are unnecessary or impractical in certain lease locations, such as upwellers located within marina slips, the Commissioner may set forth alternative marking requirements in an individual lease.
4. Lease sites must be marked in accordance with the United State's Coast Guard's Aids to Private Navigation standards and requirements.

¹² Chapter 2.37 (1) (A) of the DMR rules elaborates on the statutory language as follows:

2.37 (1) (A) (5) Existing System Support. The Commissioner shall consider the degree to which the use of the lease site will interfere with significant wildlife habitat and marine habitat or with the ability of the lease site and marine and upland areas to support ecologically significant flora and fauna. Such factors as the degree to which physical displacement of rooted or attached marine vegetation occurs, the amount of alteration of current flow, increased rates of sedimentation or sediment resuspension, and disruption of finfish migration shall be considered by the Commissioner in this determination.

Mr. Lewis testified that the west tract has “some of the softest bottom in Maine. Neither eel grass nor free-planted oysters would grow there.” The east tract has somewhat firmer bottom in the northern one-tenth of the site, he said. Mr. Lewis noted that oysters “go well with eelgrass”, in that their pseudofeces would fertilize it and their filtering of the water would provide more light, likely causing the eel grass beds to grow and expand (Lewis, testimony).

Mr. Roberts testified American oysters are native from Florida to Nova Scotia and will not interfere with any other wildlife habitat in Goose Cove (Roberts/Chapman).

Dr. Beal testified that shellfish aquaculture is “the most benign thing you can do on the water, compared to” other types of fishing, such as lobstering or scalloping. Shellfish aquaculture does no environmental harm, Dr. Beal said (Beal/Chapman).

Dr. Jane Disney of the Mount Desert Island Biological Laboratory, a biologist working on water quality and habitat restoration, particularly of eelgrass populations in Frenchman Bay, testified as a member of the public. Dr. Disney emphasized the ecological importance of eelgrass. She said she is concerned with the effect on the Goose Cove eelgrass beds of power washing the biofouling from the oyster cages and leaving it in the water. Her concerns include the potential diminution of dissolved oxygen that its decomposition could cause, as well as the potential increase in turbidity caused by a large amount of biological material in the water. Both of these conditions would harm the eelgrass in the area, she noted (Disney, testimony).

Dr. Disney stated that it would be best to start the oyster project at a smaller size and scale it up based on experience, in order to avoid unforeseen ecological harm (Disney/Mills). When cages deployed on the bottom are pulled up to the surface, Dr. Disney said, sediment on the bottom will be stirred up, creating a mud plume that reduces the clarity of the water and thus the light available to the eelgrass for photosynthesis (Disney, testimony).

It is possible to lose the eelgrass in Goose Cove within a year, Dr. Disney said, if conditions are sufficiently adverse to its survival. Eelgrass is important to stabilize sediments on the bottom; if the eelgrass is lost, the stabilizing element disappears and much more sedimentation results. She recommended having conditions in the lease to phase in the project, in order to avoid potential damage to the eelgrass beds and thus to the entire ecosystem. She noted, for example, that a bottom mussel lease on the other side of the Trenton Bridge has a lease condition imposed by the Department prohibiting mussel dragging in the area between the lease site and the nearby mud flats, where eel grass is being restored.¹³ Ecosystem management is important, Dr. Disney stated, because disturbances of the bottom such as mussel dragging can destroy an entire bay’s ecosystem. She asked the Department not to allow this to happen in Goose Cove with the proposed oyster lease (Disney/Lewis).

¹³ According to the Department’s records, lease EAST HP contains the following condition: “The leaseholder shall not drag in the area between the lease boundaries and the adjacent shoreline to the south and west of the lease site.”

Hannah Annis, a regional biologist for the Department, testified to her concern for the possible effect of the lease activities on the population of quahogs at the north end of the cove. This is the northernmost population on the U.S east coast, Ms Annis said, and the population is currently in balance, with limited, sustainable harvesting by both commercial and recreational harvesters, as well as the quahog aquaculture project operated by Mr. Porada at the head of Goose Cove.

While oysters themselves are benign, Ms Annis said, her concern is for the potential impact of 5,000 dark-colored oyster cages deployed in Goose Cove. The cages could attract heat to their dark surfaces and affect the water temperature. The large numbers of cages floating in large blocks in the cove have the potential to alter current flows and affect spat drift and settlement from the existing quahogs, which could affect the size of the quahog population. Ms Annis said that the effects of Mr. Pettegrow's operation are unknown and unpredictable, given the lack of experience with aquaculture of this type in Goose Cove. The scale of the project is of concern, she said, because it is potentially extremely large and could be built up from nothing to full deployment in just a few years, with no prior experience or information about the possible effects on the cove and no opportunity to assess the impacts of the project on the environment before they occur on potentially a very large scale (Annis, testimony).

Cleaning techniques for cages and bags. In his application, Mr. Pettegrow proposed to clean the cages and the bags inside them by using a power washer at the lease site. The consequences of this approach were the subject of much testimony at the hearings. Issues raised include:

- How long it will take to clean 5,000 cages and 30,000 mesh bags,
- How often they will be cleaned,
- What effect the noise of pressure washing will have in the cove,
- How the frequency and duration of cleaning will contribute to this effect, and
- What effect the biofouling material cleaned from the cages will have on the cove.

These issues relate to both this criterion regarding the environmental effect of the lease and to the criterion regarding the impact from noise at the lease site (item 4H below). Most of the evidence is summarized here.

Biofouling, the growth of various marine organisms on the oyster gear, reduces the flow of water and therefore of nutrients through the cages and bags to the oysters, potentially impeding their growth. Mr. Roberts testified that Mr. Pettegrow will not know the rate of fouling on gear in Goose Cove until he puts cages on the site (Roberts/Hoffman). Dr. DeAlteris testified that there is normally more fouling on gear at the surface of the water than on gear used on the bottom; he estimated that cleaning would be needed four to six times per season for gear deployed at the surface (DeAlteris/Mills). The Acadia Sea Farms closing statement estimates two to three cleanings per year. Without knowing the normal rate of fouling on gear at the surface

and at the bottom in Goose Cove, no one can be certain how many times in a season the gear will need to be cleaned to remove the biofouling.

There was no dispute that the cages and bags must be cleaned. The application states that because the cages will be made of a larger mesh than normal for cages of this type, fouling will be less, and cages may need to be cleaned only at harvest time (A11, A13). The application also states, however, that "on occasion cages may need to be power washed prior to harvest" (A12) and that cleaning at harvest time "may be done on site or at an on-shore facility" (A13). To the Department's knowledge, both the cages and the bags of oysters they contain can be cleaned by power washing without removing the oysters.

Mr. Pettegrow testified that while it would be easy to bring the cages ashore and clean them when harvesting, this is not the case when harvesting is not part of the operation, and he does not want to bring cages to shore for cleaning when harvesting is not also involved (Pettegrow/Mills). He refused to agree not to power wash cages and bags on site, stating that he wants the freedom to use "the least labor-intensive method" and that more restrictions mean "less opportunity for a successful operation" (Pettegrow/Mills).

The closing statement submitted on behalf of Acadia Sea Farms states that "The cages will only need to be 'touched' twice per year, possibly three times" (closing statement of Acadia Sea Farms, p. 2), citing spring, fall, and possibly July as times for cleaning "if there is more fouling than expected" (Ibid). The closing statement also states that "The applicant believes the cages can be cleaned only once per year, and they can be cleaned quickly and silently by dipping into hot water" (Ibid).

The method of dipping or boiling cages to remove biofouling was first mentioned by Dr. Beal in his rebuttal testimony at the Dec.1 hearing. He noted, however, that oysters must be removed from the mesh bags (and the bags removed from the wire cages) before the cages and bags can be hot-dipped or boiled. No clear description or discussion of this process took place at the hearing, so there is no evidence in the record about the noise such a method would produce or how effective it would be if it were available for use on the 5,000 cages but not on the 30,000 shellfish bags if oysters were still inside them.¹⁴

The Acadia closing statement states that boiling 5,000 cages "will take no more than 30 days" and pressure washing will take "slightly longer". This is a factual assertion that was not made at the hearing and so could not be explored or tested by questioning (Ibid, p. 10).

The Acadia closing statement also notes that "During cleaning season, the barge will be temporarily moored at the lease site, minimizing noise from commuting to an off-site mooring

¹⁴ To the Department's knowledge, "hot-dipping" or "boiling" lobster gear uses the heat of the boat's engine to warm a tank of hot water into which the gear is dipped. The engine might or might not run continuously during this process, and it might or might not be louder than a power washer; depending on the type of engine. The sound of the boat's engine, however, is likely to be of lower frequency than that of a power washer and therefore possibly less disturbing to those in the vicinity (CF, email from Jon Lewis to Diantha Robinson 11-29-11).

location” and states that one barge and two or three skiffs will be needed to clean the cages 1-3 times per year for 30 days each time (Ibid).

The rate of fouling will determine the frequency of cleaning, regardless of the method used. At maximum gear deployment of 5,000 cages containing 30,000 bags of oysters, the evidence shows that approximately a month of full-time power washing will be needed to clean all the cages and bags.¹⁵ Doing this twice or three times a year, as Acadia’s closing statement states will be the case, means a minimum of two or three months of continuous power washing or hot dipping being conducted from three or more boats in Goose Cove.

Dr. DeAlteris testified that the industry standard power washer is a gasoline powered, air-cooled; 5-horsepower engine which sounds “like the neighbors mowing their lawns” (DeAlteris/Mills). He testified that this is the most practical power washer for marine use.

The application states the “Electric power washers and/or added mufflers on the power washers will help reduce noise” (A14). Mr. Roberts said the power washer could be muffled so that the noise would be “inconsequential” (Roberts/Chapman), but Dr. DeAlteris said that because the industry standard washer is air-cooled, it cannot be muffled (DeAlteris/Mills).

Although Acadia’s closing statement repeats the statement that the pressure washer (and the winch to raise the cages) will be electrically powered by a generator with the “best available sound baffling technology” (Acadia closing statement, p. 10), this again is a factual statement that was not discussed in the course of the hearing, and no details or specifications for this electric equipment or its mufflers were presented.

Best management practices. Dr. DeAlteris testified that the “best management practices” for cleaning cages are reflected in the guidelines of the East Coast Shellfish Growers’ Association (Exhibit 17), although he noted that the Maine shellfish industry has not formally adopted these guidelines (DeAlteris/Mills). Acadia Sea Farms presented Exhibit 12, the Maine Aquaculture Association Code of Practice, which also outlines recommended standards for shellfish-growing operations.

Exhibit 12, the Maine Code, states in part:

4.13.2 Shellfish Growers/Nurseries and Growout. Strive to use gear and production strategies that minimize or eliminate the need for on-site washdown and rinsing to remove biofouling.

11.3.5 (a) Community Leadership/Noise. (i) Minimize noise from operations. (ii) Ensure that equipment mufflers are operational and effective. (v)

¹⁵ Estimates of the time required to power wash them included:

- An indeterminate length of time with 4 men working 8 hrs per day, 5 days a week (Pettegrow/R. Banach), subsequently stated in the Acadia closing statement as 30 days for hot-dipping or boiling, and “slightly longer” for power washing all the gear using 2-3 skiffs (with crews) and a barge;
- One month with 5 people working all day, cleaning 4 cages per hour, 7 days a week (DeAlteris/Mills);
- 104 days for a single boat and crew cleaning 6 cages/ hour for 8-hour days (Lewis, testimony).

Equipment such as blowers, generators, and water pumps may need sound baffles that are in excess of standard manufacturer-installed mufflers.

Exhibit 17, the ECSGA Best Management Practices, states in part:

Whenever possible, clean gear on shore and dispose of fouling materials in appropriate manner, removing them from the ecosystem. (p. 37)

Clean gear regularly and more often when infestations warrant additional care. Use only environmentally appropriate methods: air drying, brine dip, vinegar dip, or fresh water dip (p. 38).

Operate machinery in a manner that is considerate to other people on the water or in nearby homes (p. 27).

Use power washing in appropriate areas and at appropriate times (p. 38). If a power washer is being used for cleaning, be considerate of the noise generated and the timing of the cleaning operation (p. 34).

Cleaning gear and shellfish of fouling at a land-based facility with subsequent disposal in an approved land site can prevent any negative effects that can potentially occur if fouling materials are disposed of at the farm site. However, it is usually impractical and cost-prohibitive [to] take gear out of the water for all fouling removal, and most farms combine fouling control with the cleaning of gear on land only when it is ready to be repaired or stored (p. 35).

Dr. DeAlteris testified that the largest shellfish aquaculture facility in Rhode Island power washes its gear on shore and composts the biofouling material. He noted that for a shellfish aquaculture operation to be "sustainable", it cannot pollute the surrounding waters with biofouling material that will settle to the bottom, decay, and increase turbidity (DeAlteris/Mills).

Mr. Lewis testified that biofouling material is good for the ecosystem if gear is cleaned frequently; it decomposes in the water and adds its components to the ecosystem.¹⁶ If the farm operator waits too long and too much biofouling material is cleaned from the gear and left in the water, it could exceed the site's capacity to absorb it. This could reduce oxygen levels in the water and increase turbidity, harming the eel grass and other marine life in the area (Lewis, testimony).

The best practice, Mr. Lewis said, is to clean the cages before the density of the fouling material creates a problem. "If it's a problem for the bottom and the eel grass, it's already a problem for the oysters", he said. If gear is badly fouled, he recommended removing the biofouling from the site. But a preferable alternative, he said is to flip the cages over to remove biofouling naturally and avoid what would be described as "a lot of power washing." Extensive power washing, he said, raises concerns with both the noise of the power washing operation and the effect of the biofouling material on the bottom (Lewis, testimony).

¹⁶ Mr. Lewis said that oyster gear should be cleaned often enough so that "all you clean is a slime layer", not whole mussels, tunicates, sea squirts, etc. This limited amount of material could be safely washed off into the surrounding water (Lewis, testimony).

“Flipping” the cages. The “flipping” method for cleaning the cages and bags was described by Mr. Lewis, Mr. Roberts, and Dr. DeAlteris. They all testified that the OysterGro cages are designed to float just below the surface with the pontoons on top, above the water. To clean off the biofouling, the cages are flipped over so that the pontoons float underneath, raising the entire cage and the bags inside it above the water’s surface. The fouling material dries out, dies, and falls off into the water to decompose naturally.

Mr. Lewis noted that most oyster farmers do not power wash their equipment; instead, they use small, floating mesh shellfish bags that are periodically flipped over to dry one side at a time and then are shaken or brushed to remove dried biofouling. OysterGro cages are more complicated to clean, given their larger size, greater weight, and the fact that they contain six mesh bags of shellfish inside (Lewis, testimony).

Mr. Pettegrow testified that he does not want to flip the OysterGro cages, because it will require too much labor. He believes that pressure washing means fewer trips to the site than flipping the cages (Pettegrow/Lackey). He testified that in Canada (where OysterGro cages were invented), a man in waders stands on a platform on the side of a skiff and flips the cages by hand (Pettegrow/R. Banach).

Mr. Pettegrow also said that he fears the oysters will dry out on hot days while the cages are above water (Pettegrow/Lackey). But Mr. Lewis testified that the cages need not be flipped over so long that the oysters dry out (Lewis, testimony).

Mr. Roberts testified that he would advise Mr. Pettegrow to flip the cages to de-foul them. This activity, he said, would consist of a small barge to assist in turning over cages and to hold a receptacle for the biofouling material, if it is to be collected. He said that two to three skiffs, each 14-18 ft. long with 20-hp or smaller outboards and two to three men on each boat would be needed to do the flipping. One man would operate the motor, and two would flip the cages. The barge could be towed and need not be self-propelled. With 5,000 cages, it would be more appropriate to work longer, Mr. Roberts said, than to use additional resources for the task. The goal is to try to keep a single layer of oysters in the bags as they grow. “I’m not the proprietor, but it’s how I’d advise Mr. Pettegrow”, Mr. Roberts said (Roberts/J. Swanson).

Dr. DeAlteris also testified that the OysterGro cages are designed to be flipped to dry the fouling material. He said that, given the large size of the proposed operation, leaving the fouling material in the water could attract birds and impair the quality of the water for swimming. Oysters can be a “net benefit” to Goose Cove, he said, if power washing is not used and if the biofouling material is not left in the water (DeAlteris/Mills).

In his rebuttal testimony on Dec. 1, Dr. Beal said that Mr. Pettegrow wants to try different cleaning methods, including power washing and hot dipping and that “he could decide to flip the cages”. With regard to the effect of biofouling material on the eel grass in the cove, he said that the eel grass bed near the proposed lease site is not large (Beal/Chapman).

Disposal of biofouling material. Mr. Pettegrow testified that while it is possible to collect the biofouling material on the barge as the cages are cleaned and then transport it to shore, he does not want to commit to collecting or transporting it, because he is not sure it will be a problem until the site is operating at full capacity. He would prefer that DMR monitor the effects of biofouling in the water, presumably to determine if harm is occurring, before deciding that he must dispose of it elsewhere (Pettegrow/Mills, Pettegrow/Lewis). If there was not an issue with depositing it in the water, then he would not want to take the material away. He said otherwise he could "shovel it into fish trays" and "put it in a dumpster for compost and shells" (Pettegrow/Lawson).

The closing statement submitted on behalf of Acadia Sea Farms states, however, that when fouling material is removed from the cages using pressure washing or boiling water, the fouling organisms "will be collected and properly disposed of" to "ensure that excess biomass does not alter the environment, or wash up on shore" (Acadia Sea Farms closing statement, p. 8).

Birds. Dr. Beal testified that birds are not attracted by the biofouling on the cages or in the water because they do not eat it, nor can birds reach the oysters in the bags inside the cages. He said that "No one wants birds" at the lease site. Dr. Beal said that the presence of the sea farm will not cause the numbers of birds in Goose Cove to increase (Beal/Navia, Dec. 1).

Mr. Lewis testified that the proposed lease site is a potential bird roosting area and that the physical safety of the cages as a place to rest was the main feature of the site that could attract birds (Lewis, testimony).

Dr. Beal testified that bird deterrents worked well on OysterGro cages, according to a Canadian study (Beal/Chapman, Dec. 1). He said that he wanted to observe the effect on birds of flipping the cages when there are no deterrents on the under side for the brief period when the cages are turned over. Dr. DeAlteris stated that it is possible, if no bird deterrents are installed on the under side of the cages, that birds might be attracted to the cages during the time when they are flipped over (DeAlteris/Mills). Dr. Beal noted that oyster growers in the Damariscotta River (the location of most of Maine's oyster farms) flip their bags and cages, and he said that there are no reports from them of fecal coliform problems from roosting birds. If flipping works well and does not make the cages vulnerable to birds, he said, this method could be used at the proposed lease site.

Discussion. The Department is aware that oyster aquaculture in general is not only benign, but beneficial in most instances, as oysters filter out pollutants and other materials from the water, allowing eel grass and other plants to benefit from increased light penetration of the water column and possibly even providing additional nutrients to the eel grass. In this case, however, others factors could counteract the beneficial effects that are theoretically likely to result from raising oysters in Goose Cove.

These factors include the very large scale of the project, the applicant's lack of experience with oyster aquaculture and with aquaculture in Goose Cove, and the nature of Goose Cove itself,

with its extraordinarily soft, muddy bottom, its eel grass beds, and its unusual quahog population. Mr. Pettegrow's plans are broad in scope and relatively unfixed; he wants the maximum flexibility to pursue his project and adapt his techniques in light of his experience. Thus, his project amounts to an experiment conducted at an extremely large scale. The risk is that if something goes wrong at this scale, the effects could be much more far-reaching than would be the case if the project were more limited in scope.

DMR Rule Chapter 2.37 (1) (A) (5), "Existing System Support" (see footnote 16, above), provides additional detail about what the Commissioner is to consider in determining whether a proposed lease will unreasonably interfere with "significant wildlife habitat and marine habitat or with the ability of the lease site and marine and upland areas to support ecologically significant flora and fauna." The rule contains the following language:

Such factors as the degree to which physical displacement of rooted or attached marine vegetation occurs, the amount of alteration of current flow, increased rates of sedimentation or sediment resuspension, and disruption of finfish migration shall be considered by the Commissioner in this determination.

This language clearly mandates consideration of the effect of the lease activities on eelgrass and sedimentation. The evidence shows that the sea bottom on the proposed west tract and much of the east tract is extraordinarily soft; Mr. Lewis characterized it as "some of the softest bottom in Maine." Activities that disturb this soft bottom, such as the placing and raising of oyster cages as proposed in the application, are clearly likely to create mud plumes, causing, as Dr. Disney described, sediment resuspension in the water and increased sedimentation, which would be likely to harm the eel grass beds in the cove. The effects of leaving more than limited amounts of biofouling material cleaned from the oyster cages in the waters of the cove, as discussed above, also prompt concern for the welfare of other resources in the cove.

While it is possible that other activities in Goose Cove, such as digging in the mudflats to harvest shellfish or worms, motor boating and kayak paddling in shallow areas, and even the effect of wind and waves, can also stir up sediments, these activities do not occur on the scale that is proposed for the oyster lease. Whether the cages will result in warming the water of the cove or altering the current flow to the detriment of the quahogs, as Ms Annis fears, is unknown at this time, but once again, the scale of the project and the lack of experience add to the degree of risk. Given the sensitivity and importance of the resources at stake, this risk amounts to a significant potential for the lease to interfere unreasonably with the ability of the lease site to support ecologically significant flora and fauna in Goose Cove, in particular the quahog population and the eel grass beds.

In order to ensure as far as possible that the proposed lease activities do not unreasonably interfere with the ability of Goose Cove to support the ecologically significant eel grass beds and quahog population, the following conditions will be placed on the lease:

Condition: No cages or other gear on bottom. Only floating aquaculture gear may be used on the lease site. No gear is to be deployed on the bottom, other than necessary mooring gear for any floating equipment. Oyster cages are not to be sunk in an emergency without prior permission in writing from the Department.

Condition: Frequency of cleaning. All significant amounts of fouling material (i.e., more than a layer of slime) removed from gear at the lease site must be collected and disposed of in a land-based composting facility.

Conditions relating to cleaning methods are discussed under section 3H, Noise, below.

Therefore, I find that the aquaculture activities proposed for this site will not unreasonably interfere with the ability of the lease site and surrounding areas to support existing ecologically significant flora and fauna, provided that no aquaculture gear, other than mooring equipment, is deployed on the sea bottom, and that all significant amounts of biofouling material are collected and disposed of in a land-based composting facility. Oyster cages are not to be sunk in an emergency without prior permission in writing from the Department.

E. Public Use & Enjoyment¹⁷

John Kelly, planner for Acadia National Park, testified that the Park Service owns Thompson Island in fee and that the proposed lease would be in the foreground of the viewshed from the visitors' center on the island. The visual impact of the project is the Park's main concern, according to Mr. Kelly (Kelly, testimony). Thompson Island is within one-half mile of the east tract of the lease, but it is well beyond the 1,000-ft. distance that describes the area within which the Department is required to consider the effect of a proposed lease on public use and enjoyment of government-owned beaches, parks, docks or conserved lands.

The Park Service has an easement on Alley Island but no public access rights exist there and the Park does not own the island in fee, according to Mr. Kelly.

Thus, the evidence supports a finding that there are no government-owned beaches, parks, docks or conserved lands within 1,000 feet of the proposed lease; the lease will not affect the public use or enjoyment of such facilities.

Therefore, I find that the aquaculture activities proposed for this site will not unreasonably interfere with the public use or enjoyment within 1,000 feet of beaches, parks, or docking facilities or certain conserved lands owned by municipal, state, or federal governments.

¹⁷ Chapter 2.37 (1) (A) of the DMR rules elaborates on the statutory language as follows:

2.37 (1) (A) (7) Interference with Public Facilities. The Commissioner shall consider the degree to which the lease interferes with public use or enjoyment within 1,000 feet of a beach, park, docking facility or certain conserved lands owned by the Federal Government, the State Government or a municipal government.

Conserved lands means land in which fee ownership has been acquired by the state, federal or municipal government in order to protect the important ecological, recreational, scenic, cultural or historic attributes of that property. Leases may not unreasonably interfere with public use or enjoyment of such beaches, parks, docking facilities, or conserved lands. In determining interference with the public use or enjoyment of conserved lands, the Commissioner shall consider the purpose(s) for which the land has been acquired.

F. Source of Organisms¹⁸

The application indicates that the source of American oysters for the proposed lease site is Muscongus Bay Aquaculture in Bremen. The proposed source for European oysters is “an approved hatchery” (A, cover page). Mr. Pettegrow testified that he has no plans to use triploid oyster seed in his aquaculture operations (Pettegrow/Lewis).

Moving European oysters in anywhere in Maine requires a permit from the Department, since they are classified as “restricted” in order to prevent the spread of disease. Whatever hatchery Mr. Pettegrow obtains his European oyster seed from, he must obtain this permit. Movement of American oysters from within the waters between Ocean Point, Linekin Neck, Boothbay and Pemaquid Point, Bristol (including the Damariscotta and Johns Rivers), is also restricted and requires a permit from the Department under DMR Rule 24.05, but the Muscongus Bay hatchery is not located in these waters.

Therefore, I find that the applicant has demonstrated that there is an available source of stock to be cultured for the lease site.

G. Light¹⁹

The site report states that

According to the application, no lights would be used on the site. The United States Coast Guard Office of Private Aids to Navigation will review this proposal and may (or may not) require some type of navigational light be installed at the corners if the lease is granted (SR7).

¹⁸ Chapter 2.37 (1) (A) of the DMR rules elaborates on the statutory language as follows:

2.37 (1) (A) (6) Source of Organisms to be Cultured. The Commissioner shall include but not be limited to, consideration of the source’s biosecurity, sanitation, and applicable fish health practices.

¹⁹ Chapter 2.37 (1) (A) of the DMR rules elaborates on the statutory language as follows:

2.37 (1) (A) (8) Lighting Applicability. These rules apply to all exterior lighting used on buildings, equipment, and vessels permanently moored or routinely used at all aquaculture facilities, with the exception of lighting for navigation, emergencies, and construction of a temporary nature.

Exterior lighting. All exterior lighting shall be mounted in cutoff fixtures. A cutoff fixture is one that projects no more than 2.5% of light above the horizontal plane of the light fixture’s lowest part. This does not include spotlights or floodlights, which are addressed below.

All exterior lighting shall be designed, located, installed, and directed in such a manner as to illuminate only the target area and to reduce glare.

Exterior lighting shall be no more than 250 watts per fixture, with the exception of required navigational lighting, spotlights and floodlights.

When harvest schedules, feed schedules, or other similar circumstances result in the need to work beyond daylight hours, spotlights or floodlights may be used to ensure safe working conditions and safe vessel operation. Such lighting shall be directed only at the work area to be illuminated, and must be the minimum needed for safe operations.

If used, all husbandry lighting shall be submersible and operated at all times below the water line, except during examination for maintenance and repair.

When necessary, security lighting may be used, but shall conform to the requirements for exterior lighting.

An applicant shall demonstrate that all reasonable measures will be taken to mitigate light impacts from the lease activities.

No provision in these rules is intended to restrict vessel lighting levels below what is necessary for safety or as is otherwise required by state or federal law.

Both Mr. Pettegrow and Mr. Roberts testified to this effect, as well (Pettegrow/Chapman; Roberts/Chapman).

Therefore, I find that the aquaculture activities proposed for these sites will not result in an unreasonable impact from light at the boundaries of the lease site.

H. Noise²⁰

The site report states:

The applicant has indicated that small outboard powered boats, one outboard powered barge, an electric winch powered by a covered generator, and a power washer with a muffler and an enclosure over the engine to reduce sound would be used at the site. Maine Aquaculture Regulations (Chapter 2.37(9) pertaining to noise state, *"All motorized equipment used during routine operation at an aquaculture facility must be designed or mitigated to reduce the sound level produced to the maximum extent practical"* (SR7) (Emphasis in original).

As discussed above (Sec. 3D), it is apparent that cleaning all the oyster gear as the applicant proposes will require 30 days or more of continuous, full-time cleaning using either power washers or hot dipping or boiling the cages and bags. As the Applicant's closing statement says, this will be done two to three times each year, at least, resulting in two to three months of continuous mechanized cleaning activity. Mrs. Castonguay testified that if cages are power-washed as Mr. Pettegrow proposes, there will be "no quiet day" in Goose Cove (S. Castonguay, testimony).

Cathy Scarola testified to the way in which noise carries across the cove, especially in warm weather when doors and windows are left open (Scarola, testimony). Martha Higgins, a resident of the west side of the cove, stated that she can hear specific words spoken by campers on

²⁰ Chapter 2.37 (1) (A) of the DMR rules elaborates on the statutory language as follows:

2.37 (1) (A) (9) Noise Applicability. These rules apply to the routine operation of all aquaculture facilities, including harvesting, feeding, and tending equipment at leases authorized by the Department of Marine Resources, with the following exemptions:

Watercraft, harvest or transport barges, and maintenance equipment while underway;
The unamplified human voice and other sounds of natural origin;
Bells, whistles, or other navigational aids;
Emergency maintenance and repair of aquaculture equipment;
Warning signals and alarms; and
Events not reasonably within the control of the leaseholder.

Mitigation:

All motorized equipment used during routine operation at an aquaculture facility must be designed or mitigated to reduce the sound level produced to the maximum extent practical.

Centralized feeding barges, or feeding distribution systems, shall be designed or mitigated to reduce noise by installing the most effective commercially available baffles at air intakes and outlets, mounting of all relevant equipment to minimize vibration between it and the hull, and using the most effective commercially available soundproofing insulation.

All fixed noise sources shall be directed away from any residences or areas of routine use on adjacent land. An applicant shall demonstrate that all reasonable measures will be taken to mitigate noise impacts from the lease activities.

the Indian Point campground to the southeast and that she “can’t imagine” the effect of noise from “constant power washing” (Higgins, testimony).

All the testimony about power washers focused on gasoline-powered models that Dr. DeAlteris testified are the industry standard (DeAlteris/Mills). No details were presented about noise levels from electric power washers, although the application states that they would be used. Although the sound of a gasoline power washer may resemble a lawn mower, even in residential areas lawn mowers are not typically operated continuously all day, every day, for 30 days at a time.

Moreover, power washing would take place during the spring, summer, and fall. The noise of power washers in the cove as proposed by the applicant would be disturbing, continuous for up to 30 days at a time, and repeated at least two or three times each year during the seasons when people in the cove are most likely to have doors and windows open and to be engaging in outdoor activity. It is apparent that the noise produced at the boundaries of the lease site by power washers as proposed by the applicant at the scale at which he proposes to operate this lease (5,000 cages and 30,000 bags) would have an unreasonable impact on Goose Cove.

The technique of hot-dipping or boiling cages, using a tank of hot water heated by the boat’s engine, was first raised in the last evening of hearings, with no opportunity for detailed examination or assessment of this technique’s impact on the cove in terms of sound when done on the lease site continuously for 30 days at a time for a minimum of two to three times a season (see note 15 above).

The evidence shows that the OysterGro surface cages were designed to be flipped over to dry any biofouling naturally. Mr. Roberts said the sound of flipping a cage is like the splash of a bird in the water. Flipping appears from this evidence to be a workable technique that avoids problems of continuous levels of disturbing noise.

The proposed lease will meet the requirements of the Department’s rule and the statutory criterion regarding noise provided the following condition is placed on the lease:

Condition: Cages and other gear at the lease site must be flipped to clean them of biofouling material. Power washing is prohibited on the lease site.

Therefore, I find that the aquaculture activities proposed for this site will not result in an unreasonable impact from noise at the boundaries of the lease, provided that cages are cleaned by flipping them over to dry biofouling material at the lease site and that power washing on the lease site is prohibited.

I. Visual Impact²¹

²¹ Chapter 2.37 (1) (A) of the DMR rules elaborates on the statutory language as follows:

2.37 (1) (A) (10) Visual Impact Applicability. This rule applies to all equipment, buildings, and watercraft used at an aquaculture facility, excluding watercraft not permanently moored or routinely used at a lease location such as

John Kelly, National Park Service planner for Acadia National Park, testified at the September hearing that the Park Service is concerned with the view to the west across Goose Cove from the Park's Visitors' Center on Thompson Island, about a half-mile from the east tract of the proposed lease site. Mr. Kelly said that the proposed lease site is an "undeveloped site lightly used by lobstermen, lightly used for navigation, with views that are "pristine" across the bay from Acadia Park. Scenic views are one of the most important reasons people come to the Park, Mr. Kelly said. He contended that the applicant has not shown that he has minimized the visual impact of the project (Kelly, Testimony).

Mr. Pettegrow testified at the December hearing that he had reached an agreement with Mr. Kelly not to deploy floating oyster gear on the southern one-third of the east tract of the proposed lease, in order to protect the public view from the Thompson Island Bridge. That is a voluntary agreement by Mr. Pettegrow that is not relevant to consideration of this lease criterion and is not enforceable by the Department.

Peter Lazas testified on behalf of the All-America Road Byway Management Committee. He read a letter from the Committee saying that the lease will have a "significant negative impact on visitors driving on "Route 3 across Thompson Island to and from Mt. Desert Island, to the east of Goose Cove" (Lazas, testimony).

Robin Farrin testified on behalf of the applicant that she took photographs from various places around Goose Cove of thirty OysterGro cages deployed by Mr. Pettegrow in the southern part of the proposed east tract on Nov. 1, 2010 (Exhibit 31). The cages were deployed at Mr. Kelly's request (and with permission from the U.S. Army Corps of Engineers) so the Park Service could assess their effect on the view from Thompson Island. Gordon Longworth testified that he calculated the locations of the photos and their distances from the cages as shown in Exhibit 31.

OysterGro cages are made of plastic-coated mesh lobster trap wire. They are designed to float at the water's surface, and the Department will require that they be deployed this way on the proposed lease site. According to the application, the cages will be green or black; and the

harvest or feed delivery vessels. Other equipment or vessels not moored within the boundaries of a lease, but routinely used or owned by the leaseholder are subject to these requirements.

Building profiles. The size, height, and mass of buildings and equipment used at aquaculture facilities shall be constructed so as to minimize the visual impact as viewed from the water.

Height limitations. All buildings, vessels, barges, and structures shall be no more than one story and no more than 20 feet in height from the water line. Height shall be measured from waterline to the top of the roof or highest fixed part of the structure or vessel. This height limitation excludes antennae, cranes, and other similar auxiliary equipment. Structures that exist or are under construction as of the effective date of this rule are exempted from the height restriction for their useful lifetime.

Roof & siding materials. Roofing and siding materials shall not be reflective or glossy in appearance or composition.

Color. Equipment and structures shall be painted, or be of, a color that does not contrast with the surrounding area. Acceptable hues are grays, blacks, browns, blues, and greens that have a sufficiently low value, or darkness, so as to blend in with the surrounding area. Colors shall be flat, not reflective, in appearance.

The color of equipment, such as buoys, shall not compromise safe navigation or conflict with US Coast Guard Aids to Private Navigation standards.

mooring buoys will be blue (A 10-11). Mr. Pettegrow testified that he will "follow DMR's direction" regarding visual impact (Pettegrow/Chapman).

Each cage measures 58" long x 36" deep x 6" high. The two parallel black plastic flotation chambers on top each measure 58" x 11" x 8" high. When the cage is floating normally in the water, only the black plastic floats are visible, 8" high above the surface. When the cage is "flipped", the entire 6" high cage structure is visible above the water's surface, with its wire mesh bottom on top and most of the floats just visible beneath. The height of the gear visible above the water thus increases from 8" to just under 14" above the water when the cages are flipped over to defoul (illustrations appear in Exhibit C of the application).

The Department's visual impact rule requires that

the size, height, and mass of buildings and equipment used at aquaculture facilities shall be constructed so as to minimize the visual impact as viewed from the water. Equipment and structures shall be painted, or be of, a color that does not contrast with the surrounding area. Acceptable hues are grays, blacks, browns, blues, and greens that have a sufficiently low value, or darkness, so as to blend in with the surrounding area. Colors shall be flat, not reflective, in appearance (DMR Rule Chapter 2.37 (1 (A) (10))).

The thirty cages deployed as shown in Exhibit 31 were laid out in three strings of ten cages each, set parallel to each other just southwest of the tip of Haynes Point. In photographs taken from distances of 3,885 to 4,320 feet away, they are not visible at all (#2, 4, and 7). In photographs taken from distances between 3,320 and 3,740 feet, they are barely visible, appearing as distant, dark, dashed lines (#1, 3, and 8).

Only in the two photographs taken from the south end of Haynes Point can the cages be seen clearly. In photo #6, taken from a distance of 1,600 ft., the cages are visible as parallel lines of individual black bars. In photo #5, which was taken from a distance of 1,100 ft. at the closest spot in Goose Cove to either of the two proposed lease tracts, they are more clearly visible as rows of low, dark rectangles floating on the surface. The view is of the long side of the floats (58" x 8"), but one cage has swung to show only the ends of the floats, appearing as two 8" x 11" dark squares with a space between them. The appearance of the cages (actually the floats) will differ, depending on which side of the cages a viewer sees.

The DMR visual impact rule requires that equipment be constructed "so as to minimize the visual impact as viewed from the water." Ms Farrin's photographs of the cages included in Exhibit 31 are all taken from land, several feet or more above the water's surface. The higher the vantage point, the more clearly the gear will show up on the water; the ultimate view would be an aerial photograph. In contrast, views from water level across the water emphasize the closest objects, and the impact of objects farther away is diminished. The cages will appear more or less as individual units or as dim lines of black dots or dashes as the viewer moves nearer to or farther from them.

The presence of the cages in Goose Cove will be more or less noticeable from the water, depending on the distance of the viewer, the viewing angle, and the number of cages deployed. The rule requires that this impact be “minimized”, not eliminated. The cages are simple pieces of gear made of materials in colors that are dark and flat and that will blend in with the open waters of Goose Cove. There is no evidence to suggest that their visible presence can be further reduced. Therefore, it appears that the visual impact of this gear when viewed from the water has been minimized.

Condition: Plans for barge. The work barge that Mr. Pettegrow testified he has not yet built must also conform to the requirements of the visual impact rule. To ensure this, he will be required to submit plans and specifications for the barge to the Department before using it on the lease site.

Therefore, I find that the equipment, buildings, and watercraft to be used at the proposed lease site will comply with the visual impact criteria contained in DMR Regulation 2.37(1)(A)(10), provided that plans for the work barge are found by the Department to meet the requirements of this regulation prior to the barge being used on the lease site.

J. Additional Findings

At several points during the public hearing, witnesses and counsel questioned whether the applicant would consider scaling back the project, rather than asking for permission for the full 50 acres and 5,000+ cages. The applicant indicated no interest in compromising or downsizing his proposal. He has made it clear that he wants maximum flexibility to develop his project as he sees fit. Dr. Beal said that the project requires a large area because Acadia Sea Farms “doesn’t want to go through the lease process again” (Beal/Chapman).

Thus, the application before DMR is the full-scale project as proposed.

Mr. Lewis testified that the scale of the project is unusually large compared to other oyster aquaculture sites in Maine. At the ultimate level of production Mr. Pettegrow anticipates (10 million oysters per year according to the application, p. 12), the output would exceed the entire oyster harvest from all present Maine aquaculture sites, combined (Lewis, testimony).

Dr. DeAlteris testified that Mr. Pettegrow is essentially proposing “A whole spectrum of activities on an industrial scale: 5,000 cages and 30,000 bags”, with culture proposed on the surface and on the bottom. He said this would be a “huge operation”. Dr. DeAlteris noted that this is too much of an operation in too small a place (DeAlteris/Mills).

Dr. Beal testified on rebuttal that the project would be developed “moderately” using data gathered through experience on growth and survival of oysters grown at different densities, on the bottom and at the surface. Dr. Beal said that Mr. Pettegrow will decide on the number of cages to be used at the site (Beal/Chapman), based on accumulating experience as he develops the project over several years.

No oyster aquaculture project of this size and intensity of gear deployment has yet been conducted in Maine. A 23-acre site for OysterGro cages is currently proposed in the Damariscotta River; that applicant has 25 years' experience raising oysters and other shellfish and operates three lease sites, four license sites, a shellfish hatchery, and an extensive commercial operation in an area with numerous oyster aquaculture sites.

In contrast, Acadia Sea Farms' proprietor has no experience in aquaculture on a large scale. Since 2009, he has had a small license site in a lobster pound for raising juvenile oysters from seed in floating mesh bags. He has a background in commercial fishing, and his family operates a lobster pound and wholesale seafood business in the Mt. Desert area.

Many aspects of the proposed project will be worked out in practice, as the applicant gains experience. The conditions imposed on the lease are intended to mitigate the problems of which the Department is aware. The overall effect of this project on Goose Cove, as noted above, however, is difficult to predict, especially because of its unusual scale and the lack of experience with this type of activity in this location. It is important to ensure that if unforeseen problems arise with the lease operations that could jeopardize the ability of the lease site and the surrounding area to support ecologically significant flora and fauna,²² they can be discovered and addressed by the Department in a reasonably timely fashion.

The Friends of Goose Cove request in their closing statement that if the lease is granted, the Department require that the cages be kept on the bottom ("still bad for the eelgrass, but, on balance, at least better in terms of multiple compatible uses") and that "any power-washing and harvesting be done at an off-site facility" (Ibid). As discussed above, the Department has determined that the risk to the environment requires prohibiting cages on the bottom, but it has prohibited power washing at the site.

The Friends of Goose Cove also request in their closing statement that if the Department grants this proposed lease, it "mandate strict water-quality monitoring requirements and a detailed plan to ensure rapid resolution of any environmental issues – particularly concerning the eelgrass bed in upper Goose Cove" (Friends of Goose Cove closing statement, p. 10). The Department has the authority to do this according to the provisions of its rule Chapter 2.40(7).²³

Lease term and renewal. The Department is concerned, however, about the difficulty of devising a practical monitoring plan at this time, given the broad range of issues that could arise from the lease operations. Instead, therefore, the term of the lease will be limited to five years, instead of the usual ten years. The purpose of the shorter term is to allow the applicant a reasonable amount of time to develop the project (Mr. Pettegrow testified that he expected to

²² DMR Rule Chapter 2.37 (1) (B)

²³ **2.40 (7) Environmental Monitoring** The Commissioner may require that environmental monitoring be conducted on lease sites. Such monitoring shall: be conducted by the applicant or the applicant's agent; be undertaken on a schedule to be determined by the Commissioner; and shall include the information designated by the Commissioner in the lease decision, which may include, but is not limited to, an analysis of water chemistry phytoplankton, zooplankton, and fish larvae profiles. The results of such monitoring shall be summarized in a written report and submitted to the Department within 90 days of completion of each study.

build the site to full capacity in four to five years), but also to provide an opportunity for the Department to review the operations and ensure that the lease criteria continue to be met, rather than allowing the project to continue without review for an additional five years. As part of any application to renew this lease, the leaseholder will be required to demonstrate (1) that the lease operations as conducted to date have not violated any of the criteria discussed in this decision for granting the lease, and (2) that future conduct of operations under the lease if renewed will continue to meet the requirements of the lease criteria. The Department will hold a public hearing on any application to renew this lease.

Conditional basis for lease. DMR Rule Chapter 2.37 (1) (B) provides that "The Commissioner may grant the lease on a conditional basis until the lessee has acquired all the necessary federal, state and local permits." Because operation of the proposed project in Goose Cove requires a permit from the U.S. Army Corps of Engineers, the Department will condition this lease on the issuance of that permit. The lease will not be executed until the Department receives notice from the Corps that the permit has been issued.

Bond. Chapter 2.40 (2) of the Department's rules describes the requirements for performance bonds and includes the following language:

The Department may prorate the performance bond amount for a structure, no-discharge lease where structures are in excess of 2,000 square feet in order to increase the bonding requirement to satisfy the requirements of these rules.

5,000 OysterGro cages at approximately 18 square feet each constitute 90,000 sq. ft. of gear. The stated bonding requirements for leases with "structure, no discharge", are \$1,500 for leases with less than 400 sq. ft. of gear and \$5,000 for leases with more than 400 sq. ft. of gear. The purpose of the bond is to protect the Department and the State of Maine from bearing any costs for cleaning up the lease site in the event that the leaseholder does not meet his obligations.

While the language of the rule authorizes the Department to pro-rate the amount of the bond for no-discharge leases where structures cover more than 2,000 sq. ft., it contains no information on how that should be done. The proposed lease is nearly 50 times larger than 2,000 sq. ft., but a bond for 50 times \$5,000 would be \$250,000, ten times the amount of the bond required for a "structure, discharge" lease, which is normally a lease containing multiple fish pens. While the potential cost of cleaning up a 5,000 OysterGro cages and 30,000 oyster bags could well be more than the cost of retrieving two dozen fish pens, depending on the circumstances, it is reasonable to require a similar bond amount for this lease site.

Therefore:

1. The lease will be granted for a term of five years.
2. The required bond will be \$25,000.
3. Upon applying to renew this lease, the leaseholder will be required to demonstrate (1) that the lease operations as conducted to date have not violated any of the lease criteria discussed

in this decision for granting the lease, and (2) that future conduct of operations under the lease if renewed will continue to meet the requirements of the lease criteria.

4. The Department will hold a public hearing on any application to renew this lease.

5. The lease will not be executed until the Department receives notice from the U.S. Army Corps of Engineers that the permit has been issued.

4. CONCLUSIONS OF LAW

Based on the above findings, I conclude that:

1. The aquaculture activities proposed for this site will not unreasonably interfere with the ingress and egress of any riparian owner, provided that navigation corridors are established and maintained on the lease tracts as described above.

2. The aquaculture activities proposed for this site will not unreasonably interfere with navigation, provided that the site is marked in accordance with U.S. Coast Guard requirements, that navigation corridors are maintained as described above, that all gear and equipment are kept sufficiently far away from existing moorings so as not to interfere with their use, that limitations on moorings and site work are observed as described above, and that the lease site is marked in accordance with U. S. Coast Guard requirements.

3. The aquaculture activities proposed for this site will not unreasonably interfere with fishing or other uses of the area, taking into consideration the number and density of aquaculture leases in the area, provided that small-boat navigation and recreational fishing are allowed within the open areas of the lease site. Dragging will be prohibited. The lease boundaries must be marked in accordance with the requirements of DMR Rule 2.80.

4. The aquaculture activities proposed for this site will not unreasonably interfere with the ability of the lease site and surrounding areas to support existing ecologically significant flora and fauna, provided that no aquaculture gear, other than mooring equipment, is deployed on the sea bottom, that all significant amounts of biofouling material are collected and disposed of in a land-based composting facility, as described above, and that oyster cages are not sunk in an emergency without prior permission in writing from the Department.

5. The aquaculture activities proposed for this site will not unreasonably interfere with the public use or enjoyment within 1,000 feet of beaches, parks, or docking facilities owned by municipal, state, or federal governments.

6. The applicant has demonstrated that there is an available source of American oysters (*Crassostrea virginica*) and European oysters (*Ostrea edulis*) to be cultured for the lease site.

7. The aquaculture activities proposed for this site will not result in an unreasonable impact from light at the boundaries of the lease site.

8. The aquaculture activities proposed for this site will not result in an unreasonable impact from noise at the boundaries of the lease site, provided that cages and other gear at the lease site are flipped to clean them of biofouling material and that power washing is prohibited on the lease site, as described above.

9. The aquaculture activities proposed for this site will comply with the visual impact criteria contained in DMR Regulation 2.37(1)(A)(10), provided that before the work barge is used at the site, plans for its construction are reviewed by the Department and found to meet the requirements of this regulation.

Accordingly, the evidence in the record supports the conclusion that the proposed aquaculture activities meet the requirements for the granting of an aquaculture lease set forth in 12 M.R.S.A. §6072, provided that:

The conditions described above are applied to this lease; and

The lease term is five years;

The bond is \$25,000;

The Department holds a public hearing with respect to any application to renew this lease;

Before renewing this lease, the Department finds, based upon the evidence, that (1) that the lease operations as conducted to date have not violated any of the lease criteria discussed in this decision for granting the lease, and (2) that future conduct of operations under the lease if renewed will continue to meet the requirements of the lease criteria; and

The lease is granted on a conditional basis and will not be executed until the Department receives notice from the U.S. Army Corps of Engineers that it has issued a permit to Acadia Sea Farms, Inc. for this proposed project.

5. DECISION

Based on the foregoing, the Commissioner grants the requested lease of 50 acres to Acadia Sea Farms, Inc. for five years for the purpose of cultivating American oysters (*Crassostrea*

virginica) and European oysters (*Ostrea edulis*) using suspended culture techniques only. The application for bottom culture is denied.

The applicant shall pay the State of Maine rent in the amount of \$100.00 per acre per year. The applicant shall post a bond or establish an escrow account pursuant to DMR Rule 2.40 (2) (A) in the amount of \$25,000.00, conditioned upon performance of the obligations contained in the aquaculture lease documents and all applicable statutes and regulations.

This lease is granted conditioned on the issuance of a permit to Acadia Sea Farms, Inc. from the U.S. Army Corps of Engineers to place gear on the lease site. The lease will not be executed and the applicant's rights in the site will not take effect until the Department receives notice from the U.S. Army Corps of Engineers that it has issued a permit to Acadia Sea Farms, Inc. for this proposed project.

In order to renew this lease, the Department must find, based upon the evidence and after conducting a public hearing, that the lease operations as conducted to date have not violated any of the lease criteria discussed in this decision for granting the lease and that future conduct of operations under the lease if renewed will continue to meet the requirements of the lease criteria. Upon making such findings, the Department may renew the lease for a term of no more than ten years.

6. CONDITIONS TO BE IMPOSED ON LEASE

The Commissioner may establish conditions that govern the use of the lease area and impose limitations on aquaculture activities, pursuant to 12 MRSA §6072 (7-B)²⁴. Conditions are designed to encourage the greatest multiple compatible uses of the lease area, while preserving the exclusive rights of the lessee to the extent necessary to carry out the purposes of the lease.

The following conditions shall be incorporated into the lease:

1. The lease site must be marked in accordance with both U.S. Coast Guard requirements and DMR Rule 2.80.

2. Two navigation corridors 250 ft. wide must be maintained on each lease tract, located according to a gear plan approved by the Department, as more particularly described in the text of the decision. The corridors must be maintained free of all floating and bottom gear, including mooring gear and moored boats and work platforms, so that vessels can freely navigate across each tract. Each corridor must be marked with floating buoys at each corner containing the words "Area open to navigation" in letters at least two inches high.

²⁴ 12 MRSA §6072 (7-B) states: "The commissioner may establish conditions that govern the use of the leased area and limitations on the aquaculture activities. These conditions must encourage the greatest multiple, compatible uses of the leased area, but must also address the ability of the lease site and surrounding area to support ecologically significant flora and fauna and preserve the exclusive rights of the lessee to the extent necessary to carry out the lease purpose."

3. All gear and equipment must be kept sufficiently far away from existing moorings so as not to interfere with their use.

4. Between May 1 and October 30 of each year, all work on the lease site must be conducted within the boundaries of the site, and all vessels, barges, rafts, work platforms, and other floating craft or gear associated in any way with the lease operations must be anchored or moored within the boundaries of the lease. Site work, anchoring, and mooring must not impede the transit of vessels through the navigation corridors required to be established on the lease tracts.

5. Small-boat navigation and recreational fishing are allowed within the open areas of the lease site. Dragging is prohibited.

6. All significant amounts of fouling material (i.e., more than a layer of slime) removed from gear at the lease site must be collected and disposed of in a land-based composting facility.

7. Cages and other gear at the lease site must be flipped to clean them of biofouling material. Power washing is prohibited on the lease site.

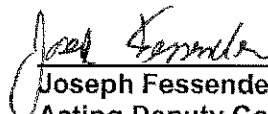
8. Only floating aquaculture gear may be used on the lease site. No gear is to be deployed on the bottom, other than necessary mooring gear for any floating equipment. Oyster cages are not to be sunk in an emergency without prior permission in writing from the Department.

9. Construction plans for any work barge to be used at the lease site must be reviewed by the Department and found to meet the requirements of this regulation before the work barge is used at the site.

7. REVOCATION OF LEASE

The Commissioner may commence revocation procedures upon determining pursuant to 12 MRSA §6072 (11) and DMR Rule Chapter 2.42 that no substantial aquaculture has been conducted within the preceding year, that the lease activities are substantially injurious to marine organisms, or that any of the conditions of the lease or any applicable laws or regulations have been violated.

Dated: 1-23-2012



Joseph Fessenden
Acting Deputy Commissioner
Department of Marine Resources

EXHIBIT LIST

Maine Dept. of Marine Resources - Aquaculture Lease Hearing

Acadia Sea Farms - Docket No. #2010-10

EXHIBITS PRESENTED AT SEPTEMBER 20-22, 2010 HEARING:

- # 1. Case File, consisting of 3 file folders:
 - 1-A: pre-application material;
 - 1-B: post-application material
 - 1-C: comment letters from pre-hearing comment period
- # 2. Application of Acadia Sea Farms
- # 3. DMR Site Report
- # 4. Poster, aerial photo of Goose Cove prepared by DMR showing lease tracts and marked at hearing with Conrad Hoffman mooring
- # 5. Poster, NOAA chart #13316 of Goose Cove prepared by DMR showing lease tracts and marked at hearing with Michael Grunze mooring
- # 6. Letter, Maine Aquaculture Association to DMR, dated 9-20-10, 1 page
- # 7. Document, e-mail from National Marine Fisheries Service/Jaclyn Daly to Susan Hatton, dated 9-20-10, 1 page
- # 8. Document, Seal-watching guidelines, 2 pages
- # 9. Letter, Muscongus Bay Aquaculture to Warren Pettegrow, dated 9-17-10, 1 page
- # 10. Letter, Bar Harbor Bank & Trust/Susanne M. Griffin to Whom It May Concern, dated 9-15-10, 1 page
- # 11. Map on letter-size sheet titled "Maine Coast Eelgrass Distribution", 1 page
- #12. Document, Maine Aquaculture Association Code of Practice, 35 pages
- #13. Poster titled "Chart Map/Goose Cove/Trenton, Maine" prepared by Longworth Associates, 9-16-10, NOAA Chart #13316 of Goose Cove, showing lease tracts and marked at hearing with distances to shore and existing aquaculture lease sites
- #14. Poster titled "Aerial Map/Goose Cove/Trenton, Maine", prepared by Longworth Associates 9-16-10, aerial photo of Goose Cove showing lease tracts
- #15. Computer disc titled "Lease Site Video," containing video of Goose Cove taken 9-19-10 by Warren Pettegrow

- #16. Document, Résumé of Joseph DeAlteris, 28 pages
- #17. Document, "Best Management Practices for East Coast Shellfish Aquaculture Industry", 9 pages, including cover page and pp. 15, 26-27, 34-38
- #18. Letter, Town of Trenton to DMR, dated 7-13-10, 4 pages
- #19. Document, Résumé of John Bennett, 2 pages
- #20. Photograph 4" x 6" of sailboat, labeled on reverse "Boat name: Marie/Owner: Mike Grunze/Photographer: Carole Stoddard"
- #21. Document, Federal Aviation Administration Advisory Circular #150/5200-33B, Subject Hazardous Wildlife Attractants on or Near Airports, 25 pages printed double-sided
- #22. Letter, Cody Baciуска, Loomacres Wildlife Management to Allison Navia, Hancock County-Bar Harbor Airport, dated 9-8-10, 1 page, & résumé of Cody Baciуска, 2 pages
- #23. Poster mounted on foam core board, aerial photo of Goose Cove showing depth contours and mooring locations & paper mask to cover all water shallower than the 5-ft. depth contour line, prepared by Conrad Hoffman
- #24. Letter, Sheree Castonguay and Jeffrey Castonguay to DMR, dated 9-13-10, 2 pages, & 2 photographs 8" x 10" of Goose Cove in winter
- #25. Document, e-mail containing photographs of sailboats from Michael Grunze to Friends of Goose Cove dated 9-22-10, admitted for first photograph of 2 sailboats in Goose Cove only
- #26. Photographs (3) of boats in Goose Cove, labeled on reverse:
- "Boat Name: Tug It East/Owner: Fred Stoddard/Photographer: Carole Stoddard", size 4" x 6"
 - "5 Cameron Boat", size 4 3/8" x 5 1/2"
 - "1 Small Boat (on left) owner John Bennett/Boat Owner: Bruce Cameron/Photographer: Carole Stoddard", size 4' X 6"
- #27. Photographs (7) by Linda Morin:
- One photograph 4" x 6" of bald eagles
 - Six photographs 5" x 7", labeled on reverse "View of site area from Thompson Island 6/10"
- #28. Document, affidavit of Cathy Scarola dated 9-13-10; plus one-page list & 15 pages containing 60 photographs printed 4 per page, total 17 pages

EXHIBITS PRESENTED AT DECEMBER 1, 2010 HEARING:

- #29. Document, journal article: Comeau, St-Onge, Pernet, and Lanteigne, 2009, Deterring coastal birds from roosting on oyster culture gear in eastern Canada. *Aquacultural Engineering* 40:87-94.
- #30. Document, journal article: Ward and Shumway, 2004, Separating the grain from the chaff: particle selection in suspension and deposit feeding bivalves. *Journal of Experimental Marine Biology and Ecology* 300:83-110.
- #31. Poster, aerial photograph of Goose Cove and 8 photographs of oyster cages deployed on east tract, prepared by Longworth Associates, December 1, 2010
- #32. Poster, marked "Haynes Pt./Overlay Map/Goose Cove/Trenton, Maine", prepared by Longworth Associates, December 1, 2010, NOAA chart #13316 of Goose Cove showing lease tracts and GPS points at low tide 11-30-10
- #33. Poster, marked "Haynes Pt./Overlay Map/Goose Cove/Trenton, Maine", prepared by Longworth Associates, December 1, 2010, Black and white image of Hoffman map (Exhibit 23) over NOAA chart #13316 of Goose Cove showing lease tracts and GPS points at low tide 11-30-10 & Hoffman house and mooring
- #34. Document, written statement read into record by Douglas Chapman, Esq., on behalf of Warren Pettegrow on 12-1-10, 1 page & aerial photograph on letter-size paper titled "Goose Cove/Trenton, Maine/Viewshed Map", prepared by Longworth Associates, November 29, 2010, aerial photograph of Goose Cove with lease tracts marked & inset photo #3 of oyster cages from Exhibit 31