STATE OF MAINE
DEPARTMENT OF MARINE RESOURCES
Standard Aquaculture Lease Application
Suspended culture of American oysters
(*Crassostrea virginica*) and
European oysters (*Ostrea edulis*)
Thomas Bay, Bar Harbor

Bar Harbor Oyster Co, LLC
EAST TB
Docket #2015-10

September 1, 2016

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION

Bar Harbor Oyster Co., LLC, a Maine corporation, applied to the Department of Marine Resources ("DMR") for a standard aquaculture lease on 22.04[1] acres located in the coastal waters of the State of Maine, in Thomas Bay in the Town of Bar Harbor in Hancock County, for the purpose of cultivating American oysters (*Crassostrea virginica*) and European oysters (*Ostrea edulis*) using suspended culture techniques. DMR accepted the application as complete on June 2, 2015. Friends of Thomas Bay and Rebecca Richardson, a member of Friends of Thomas Bay, applied to intervene in this case (CF). Based on the expertise demonstrated by Friends of Thomas Bay, and by Ms. Richardson, these two intervenors were consolidated on July 22, 2016 when Ms. Richardson's intervenor application was withdrawn (CF). DMR accepted testimony from the intervenor on the following topics that were pertinent to the criteria which DMR must consider when determining whether to grant a standard aquaculture lease:

- kayaking
- navigation
- recreation (including swimming)
- noise pollution
- light pollution
- recreational fishing
- mooring boats
- riparian access (ingress and egress)

A public hearing on this application was held on July 28, 2016, at the Bar Harbor Town Hall in Bar Harbor, Maine.

[1] Please note, this acreage differs from the acreage reflected in the lease Application. Based on the Latitude and Longitude corner points provided in the application, DMR staff recalculated acreage using ESRI ArcGIS software and arrived at this more accurate acreage.

1. THE PROCEEDINGS

Notices of the hearing and copies of the application and DMR site report were provided to numerous state and federal agencies for their review, as well as to various educational institutions, aquaculture and environmental organizations, the Town of Bar Harbor and the Bar Harbor Harbormaster, members of the Legislature, representatives of the press, riparian landowners, and other private individuals. Notice of the hearing was published in the *Mt. Desert Islander* on June 16, 2016, and in the July 2016 edition of *Commercial Fisheries News.*

Sworn testimony was given at the hearing by: the applicant; DMR's Division of Aquaculture Director, Jon Lewis; Gordon Longsworth (geographic information systems analyst, expert witness for the applicant); Dr. Brian Beal (marine sciences expert witness for the applicant); Charles Phippen (Bar Harbor Harbormaster and Bar Harbor Shellfish Warden, expert witness for the applicant); Katy Degrass (Maine certified kayak guide, expert witness for the applicant); Attorney Sally Mills (representing Friends of Thomas Bay); Glenn Milligan (riparian owner, speaking on behalf of Friends of Thomas Bay); and Dr. Joseph Dealteris (marine sciences expert witness for Friends of Thomas Bay). Public comment was also taken from William Stockman, of Trenton, Maine. Eleven comment letters were received by email and regular mail to the department, 10 of which concerned bird attraction issues, and one from the Town of Bar Harbor expressing that the Town Council is in support of the application and that no negative comments were expressed at the Council meeting nor by the Marine Resources Committee for the town, which also reviewed the application (Exhibit 8). The applicant described his proposed project. Mr. Lewis described the site visit and presented a videotape of the bottom.

Each witness was subject to questioning by the Department, the applicant, the intervenors, and members of the public. The U.S. Army Corps of Engineers was represented by Shawn Mahaney. The hearing was recorded by DMR. The Hearing Officer was Hannah Dean. Dr. Beal testified that the application is in line with aquaculture best practices and will not have negative ecological impacts on the area. Mr. Phippen testified regarding fishing, boating, and navigational uses in the area. Ms. Degrass testified that she regularly kayaks in the area and has safely kayaked around existing LPAs operated by the applicant. She was not able to comment on whether kayaking would be difficult in a layout of oyster

grow cages along the lines of the applicant's proposal, as she has not kayaked around large aquaculture farms. Ms. Mills described the membership and gave a general overview of the concerns of the Friends of Thomas Bay (See, Exhibit 5). Mr. Milligan testified as to his experience kayaking in the area and his observations of swimming in the area of the proposed lease tracts. Dr. Dealteris testified as to best practices for aquaculture sites in regards to noise and light contamination, as well as the density of cages. Mr. Stockman's public comment focused on concerns about the attraction of birds to cages and potential contamination of the product through bird vectors.

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

A. LIST OF EXHIBITS[3]

a. Case file, (CF)
b. Application completed June 2, 2015 (App)
c. DMR site report completed April 29, 2016 (SR)
d. Town of Bar Harbor - Bar Harbor Oyster Letter of Support (PDF received by mail June 26, 2015 from Cornell F. Knight, Town Manager of Town of Bar Harbor, ME)
e. Information on Friends of Thomas Bay (PDF received by email 7/14/2016 from Intervenor Applicant Friends of Thomas Bay Representative, Sally Mills)
f. Email from Sally Mills Re: Follow up on Information Request Re: Bar Harbor Oyster LLC Application July 28th Hearing (Email received 7/14/2016 from Intervenor Applicant Friends of Thomas Bay Representative, Sally Mills)
g. Resume - Joseph DeAlteris (Word Document received by email 7/14/2016 from Intervenor Applicant Friends of Thomas Bay Representative, Sally Mills)
h. Folder of Comment Letters (Received by DMR by email and mail)
i. Map of Eelgrass conservation areas in Thomas Bay (Submitted during the July 28, 2016 hearing by Ms. Mills for the Friends of Thomas Bay).

[2] In references to testimony, "Smith/Jones" means testimony of Smith, questioned by Jones.
[3] Exhibits 1, 2, and 3 are cited below as: Case file – "CF"; Application – "App", site report – "SR". Other exhibits are cited by number.

2. DESCRIPTION OF THE PROJECT

A. Site History

Presently, the applicants hold 8 Limited Purpose Licenses (LPAs) for the culture of shellfish within the general vicinity of the proposed lease area (JWAL115, JWAL215, JWAL315, JWAL415, JFOG115, JFOG315, JFOG415, JFOG516) (SR 2, 3).

B. Site Characteristics

The proposed lease site is located in Mr. Desert Narrows, east of Israel Point and west of Thomas Island, Bar Harbor, Hancock County, Maine.

On September 25, 2016, DMR biologists Jon Lewis and Marcy Nelson visited the proposed lease site and assessed it and the surrounding area in light of the criteria for granting an aquaculture lease, as described in the site report.

The area around the site is currently classified by the Department's Water Quality Classification program as "open/approved for the harvest of shellfish" (SR 17).

The site report describes the proposed lease site and its surroundings as follows:

> The bottom consisted of fine sediments with little topographical variations and no attached or rooted vegetation was observed (SR 3).

Mean low water depth within the area of the proposed lease, as calculated from measurements taken during the site visit, ranged from 5 to 9 feet throughout the south tract, and 8 to 9 feet within the north tract (SR 4). Corrected MLW depths are approximately 4-5 feet throughout the majority of both proposed lease tracts, and deepen to a maximum of 17 feet along the eastern boundary of the south tract (SR 4).

C. Proposed Operations

The applicant is applying for a standard, 10 year lease to culture American or Eastern oysters and European oysters using floating cages in the spring through fall, and submerged cages over the winter. The applicant will source seed from Muscongus Bay Aquaculture (App, Cover Page). At full site development which will be reached at year three of the lease, the applicant plans to deploy a maximum of 1,240 OysterGro cages in 160 foot long-lines, supporting 10 cages each, for a total of 124 lines. The applicant proposes to maintain 28 to 30 feet between long lines to allow for vessel navigation, and each cage would measure 68"Lx40.5"Wx20"H. Each cage would hold 6 mesh oyster bags, and during

the winter months, the cages would be submerged (SR 2, App 4-6). The applicant will use 170 cages during the first year of operation, 500 total cages the second year, and 1240 cages by the third year. However, applicant will maintain the density of cages and spacing described above even at maximum capacity, ensuring minimal bottom shading and providing space needed for sinking cages in deeper areas to avoid ice damage during the winter (App 6, applicant testimony).

Storage and processing will take place on a floating upweller and work platform measuring 24'Lx12'Wx4'H and supporting a shelter measuring 8 feet in height that will be deployed in the southeastern corner of the south tract (SR 3, App 7). The applicant's residence will be used as the sanitary facility for the site, and no hazardous materials will be stored on the site (App 8). Gear colors will be black, including solar panels. The upweller float and house will be constructed from pressure treated timber, with black plastic dock floats, rope line will be a natural brown, and buoys as well as markers will be white (App 8).

The applicant will utilize a 15' welded aluminum work-skiff to transport product from the site, and will be moored off site at Hadley Point (App 9). A larger skiff of about 20', similar to a Carolina Skiff, will be used for crew and product transport and will be used to haul in and flip cages in order to prevent fouling (App 9). Finally, a pontoon boat measuring approximately 24'x10' will be used as a work barge on the site (App 9). The applicant plans to moor both the 20' skiff and the pontoon boat on the lease site (App 9). All vessels will be powered by low emission and quiet 4-stroke outboard engines and any maintenance except for emergency repairs will be made off site (App 9). Major activities to be conducted on site will include raising cages from the ocean floor to the surface and tumbling and grading oysters on the pontoon boat (App 10). The applicant will not use floodlights as they will operate during daylight hours (applicant testimony). The applicant will use the flipping method in order to clean the cages. When cages are flipped and left to dry out, organic matter will dry and fall off naturally, without the need to use power washing. Therefore, the applicants testified that they will not employ power washing (applicant testimony).

The applicant anticipates operating the site using two employees during the first season, after which the applicant anticipates hiring additional seasonal employees during the second and third years. However, the applicant does not foresee having more than four employees working on site at any one time, and will likely have additional onshore employees for other aspects of the operations such as marketing and delivery (App 11).

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.

A. Riparian Access

The site report provides the following distances to shore for each tract (SR 5):

North Tract
N1 to Trenton Boat Launch: ~3,750 feet to the northeast
N1 to Bar Harbor Airport (Runway 35): ~4,321 feet to the northeast
N2 to Thomas Island (MLW): ~243 feet to the east
N4 to Western Edge of Channel, 12 foot contour (MLW): ~480 feet to the west

South Tract
S2 to 6 foot contour line (MLW): ~130 feet to the east
Eastern boundary to 6 foot contour line (MLW): ~120 feet to the east
S3 to nearest intertidal mudflat (MLW): ~267 feet to the east
Western boundary to Israel Point (MLW): ~137 feet to the west
Western boundary to Israel Point (MHW): ~260 feet to the west

During the site visit, DMR staff did not observe docks or moorings with which the proposed activities would interfere. The north tract is approximately 240 feet at MLW to the west of the undeveloped western shore of Thomas Island. The south tract is about 137 feet from Israel Point at MLW. The proposed south tract lies adjacent to a developed shorefront property, but that property does not include any docks or moorings that DMR

staff observed during the site visit (SR 6). No docks or moorings were observed elsewhere in the vicinity of the site, and the distance from all shores is over 100 feet at MLW, indicating that ingress and egress will not be impeded by the site (SR 6).

Therefore, I find that the aquaculture activities proposed for this site will not unreasonably interfere with the ingress and egress of any riparian owner.

B. Navigation

The proposed site occupies shallow subtidal waters to the east and west of a small channel leading into Thomas Bay. Navigation at low tide will likely be dominated by local clammers and wormers accessing the intertidal mudflats (SR 9). Mr. Phippen testified that there is limited boating in the area and that boat sizes range from approximately 12 to 20 ft in length, include skiffs and outboard motor boats (Phippen testimony). Mr. Phippen further testified that most boats are launched from the Trenton sea plane ramp and that the proposed gear layout is arranged in a way that would not interfere with major navigational corridors in the area (Phippen testimony). Aquaculture lease sites are required to be marked for navigation purposes 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.

C. Fishing & Other Uses

The site report indicates that DMR staff did not observe commercial or recreational fishing within the boundaries or in the immediate vicinity of the proposed site. However, the presence of patchy mussel beds on the bottom would indicate that mussel dragging occurred in the past. Furthermore, clamming and worming likely take place on the intertidal mudflats surrounding the proposed site (SR 9).

Mr. Phippen testified that he knows of about a dozen skiffs which navigate in the area, fishing for worms and shellfish, and Bar Harbor has four commercial shellfish harvesters (Phippen testimony). However, Mr. Phippen stated that the shellfish harvesters are aware of the lease proposal and have expressed that the lease operations will not have an impact on the areas where they harvest (Phippen testimony). The evidence indicates there is minimal commercial or recreational fishing within the proposed lease boundaries,

or in the immediate area, and that existing commercial fishing operations will not be impacted (SR 9, Phippen testimony).

Based on testimony received during the hearing held July 28, 2016, members of Friends of Thomas Bay testified that they used the area frequently for kayaking (Milligan testimony). Testimony was also provided by a certified kayak guide who expressed that given the clearance that the proposed site will provide between lines of cages, a typical kayak and paddle could maneuver within the proposed gear if necessary (Degrass testimony). However, the kayak guide could not offer actual experience in this regard, only conjecture based on having kayaked around existing smaller sites currently operated in the area by the applicant (Degrass testimony). Kayaks range between 12 and 16 feet in length (Degrass testimony, Phippen testimony). As stated in the section above describing operations, applicant proposes to maintain 28 to 30 feet of clearance between lines. While this clearance will not provide as much maneuverability as open water, it will not preclude kayaking in the area, and will leave approximately 12 to 18 feet of clearance beyond the length of the kayak, and depending on the model of kayak.

During the hearing, testimony was also provided indicating that swimming occurs at some frequency during the summer (Milligan testimony). However, testimony indicated that swimming occurred near shore – and the proposed lease site boundaries are all over 100 feet from any shoreline at MLW (SR 5). This would indicate that even at MLW there will be room between the shore and the proposed lease site for swimming in the area.

Other aquaculture leases. According to the site report, there are three aquaculture leases designated for the bottom culture of blue mussels (*Mytilus edulis*) within 1 mile of the proposed lease site (EAST HP, EAST OP, and EAST OP2) (SR 9). In addition, within the boundaries of lease EAST OP there are 6 Limited Purpose Aquaculture Licenses (MBEA116, MBEA216, RSMI116, RSMI216, RSMI316, and RSMI416) for the culture of blue mussels on long-lines. Additional leases and licenses are located over a mile due north, east, and west of the proposed lease tracts (SR 9). Given that other aquaculture sites and licenses are at a significant distance from the proposed site, the proposed aquaculture activities would not interfere with existing aquaculture uses in the area.

Exclusivity. The applicant will mark the site in accordance with DMR Rule 2.80.[4]

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[4] **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

The applicant stated in the application that they will "welcome" the use of kayaks and small recreational boats on the site "as long as people do not tamper with...gear and equipment" (App 18). These restrictions are reasonable in order to enable the aquaculture project to be carried out while encouraging the greatest number of compatible uses of the area, as provided in 12 MRS §6072 (7-B). Conditions reflecting these restrictions will be included in the lease.

The evidence supports the conclusion that the site will not unreasonably interfere with fishing and other uses in the surrounding area. The lease site must be marked as required in DMR Rule Chapter 2.80.

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.

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.

D. Flora & Fauna

Site observations. Species of marine flora and fauna were observed by DMR biologists during the site visit included as follows:

South Tract (SR 11-12):

Worm holes/castings - abundant
Blue mussels (*Mytilus edulis*) – common to abundant in scattered clumps
Green crab (*Carcinus maenus*) – common
Frilled anemone (*Metridium senile*) – commonly associated with mussels
Sand Shrimp (*Crangon septemspinosa*) – common
Mysid Shrimp (*Praunus flexuosus*) – common
Common sea star (*Asterias sp.*) - occasional
American lobster (*Homarus americanus*) – occasional
Rock crab (*Cancer sp.*) – occasional
Burrowing anemone (*Edwardsia sp.*) – occasional
Mud snails (*Littorina sp.*) – one large patch associated with decomposing knotted wrack
(*Ascophyllum nodosum*)Waved whelk (*Buccinum undatum*) – one shell
Kelp (*Laminaria/Saccharina sp.*) – unattached and occasional
Red algae (unidentified) – occasional
Beggiatoa sp. – single patch near decaying seaweed

North Tract (SR 13):
Worm holes/castings - abundant
Enteromorpha sp. – common
Sand Shrimp (*Crangon septemspinosa*) – common
Mysid Shrimp (*Praunus flexuosus*) – common
Green crab (*Carcinus maenus*) – common
Rock crab (*Cancer sp.*) – occasional
American lobster (*Homarus americanus*) – occasional
Crab/lobster burrows – common
Blue mussels (*Mytilus edulis*) – occasional small clump
Frilled anemone (*Metridium senile*) – occasionally associated with mussels
Common sea star (*Asterias sp.*) - occasional
Burrowing anemone (*Edwardsia sp.*) – occasional
Kelp (*Saccharina sp.*) – unattached and occasional
Red algae (unidentified) – occasional
Beggiatoa sp. – single patch

Based on these observations, it is apparent that there is no eelgrass within the bounds of the proposed lease tracts. During the hearing, evidence was entered into the record showing a map of proposed areas for eelgrass restoration in the vicinity of the proposed lease tracts (Exhibit 9, Mills testimony, DeAlteris testimony). However, none of

the proposed areas for eelgrass restoration are within the bounds of the proposed lease tracts, indicating that the aquaculture gear will not negatively impact these restoration efforts.

Fisheries & wildlife. Copies of the application were provided to the Maine Departments of Environmental Protection and Inland Fisheries and Wildlife (MDIF&W) for review. One comment was received by email on June 30, 2015, from John Perry, Environmental Review Coordinator at MDIF&W noting that the proposed site is within a tidal waterfowl and wading bird habitat (CF). Based on this, Mr. Perry recommended that the siting of the project avoid intersecting with mud flats (CF, SR 15). During the hearing, applicants noted that they made sure that their lease tracts would not overlap with mudflats (applicant testimony). During the site review, DMR staff did observe a small flock of Bonaparte's gulls between the proposed southern tract and Israel Point, as well as three cormorants resting on the existing OysterGro cages being used on the current LPA sites within the proposed lease area (SR 16).

It appears from this evidence that the ecology of the proposed lease site and surrounding area will not be adversely affected by the lease activities.

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.

E. Public Use & Enjoyment

According to the site report, "there are no publicly-owned beaches, conserved lands, or [public] docking facilities or beaches within 1,000 feet of the proposed lease" (SR 16). Thomas Island, to the east of the north tract, is privately owned and managed by Maine Coast Heritage Trust. The Twinnies Islands are over 2,000 feet to the east of the proposed lease area, and are owned by the U.S. Fish and Wildlife Service (USFWS). The nearest boundary of Acadia National Park on Thompson Island is over 2,000 feet to the west of the proposed south tract, and the Maine Bureau of Parks and Land maintains an easement along the shoreline of Thomas Bay, to the east of Blunt Point and over 3,000 feet from the proposed lease. Conserved land data was acquired from the Maine Office of GIS and utilized by Maine DMR staff in order to assess whether the proposed lease would interfere with public use and enjoyment (SR 16).

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.

F. Source of Organisms

The application indicates that the source of stock for this proposed lease site is Muscongus Bay Aquaculture (App cover page).

Moving European oysters anywhere in Maine requires a permit from the Department, since they are classified as "restricted" in order to prevent the spread of disease. 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.

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

G. Light

The applicant stated in his application that no lights will be used on site, and all work will take place during daylight hours, unless there is an emergency, such as a serious malfunction, or other problem that requires immediate attention (App 12, SR 17, applicant testimony).

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. Noise

The application states that he will be using some power equipment on the site which will produce some noise. The following is an inventory of noise generating equipment which will be used on site as well as noise reduction measures that the applicant will be utilizing (App 11-12, applicant testimony):

a. A 15' skiff with a 60 HP Yamaha 4-stroke to move employees to and from the site, and to flip cages.
b. A 20' flat-bottom skiff with 60 HP 4-stroke outboard which will utilize a silent electric pot hauler to raise cages for flipping and harvesting.
c. A pontoon deck-barge with a 4-stroke outboard motor, equipped with a Honda hydraulic power unit, used to run the tumble grader and hauler, bolted to the vessel with rubber isolators to reduce vibration noise.
d. An additional muffler will be applied to the Honda's exhaust system.
e. A small house will be built over the Honda motor with Sound Down noise-suppressing insulation.
f. The Honda hydraulic pack will power a hydraulic hauler motor and centrifugal water pump for washing.
g. A solar-powered upweller utilizing an axial flow, high volume, low-pressure pump to circulate water for oyster seed will be mounted on a floating dock measuring 24'x12', with a small house structure.

The applicant stated in his application that the work skiffs will be used on a daily basis, except for Sundays, to transport, flip cages, maintain cages, lines, and harvesting and that the pontoon barge will be moored on-site and used for tumbling and grading of oysters for one week each month (App 12, applicant testimony). At the beginning of the growing season, the pontoon barge will be used to raise and sink cages. The upweller will be moored on-site for the growing season and will be removed before the end of fall. Therefore, the upweller will be used as a work platform during the growing season but will only run as a functional upweller for about 2 months out of each growing season (App 12, applicant testimony).

The site report observes that the applicant has invested the best available technology and made every accommodation to minimize noise intrusion (SR 17).

Based on this evidence, it appears that any noise generated by operations on the site is unlikely to have a significant effect at the boundaries of the lease, and that the applicant has taken every effort available to reduce noise and light pollution from the proposed operations.

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.

I. Visual Impact

The site report notes that the applicant proposes to use floating cages and bags, which are black in color and would protrude from the water's surface at most 20 inches, and only when in the drying position (SR 17). The proposed upweller/work float is made of wood and supports a structure which will be 12 feet high at its highest point and will measure less than 12 feet above the water's surface, given that a portion of the float will be submerged (SR 17). The overwintering cages will be deployed under water and will not be visible (applicant testimony). No other structures will be placed on the site, other than any navigational aids that may be required.

The Department's visual impact rule requires structures and gear on lease sites to blend with the surroundings as much as possible. The evidence shows that this will be the case on the proposed 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).

4. CONCLUSIONS OF LAW

Based on the above findings, I conclude that:

a. The aquaculture activities proposed for this site will not unreasonably interfere with the ingress and egress of any riparian owner.

b. The aquaculture activities proposed for this site will not unreasonably interfere with navigation.

c. 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.

d. 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.

e. 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.

f. 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.

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

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

i. The aquaculture activities proposed for this site will comply with the visual impact criteria contained in DMR Regulation 2.37(1)(A)(10).

j. 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.

5. DECISION

Based on the foregoing, the Commissioner grants the requested lease of 22.04 acres to Bar Harbor Oyster Co., LLC for ten years for the purpose of cultivating American oysters (*Crassostrea virginica*) and European oysters (*Ostrea edulis*) using suspended culture techniques. The lessee shall pay the State of Maine rent in the amount of $100.00 per acre per year. The lessee shall post a bond or establish an escrow account pursuant to DMR Rule 2.40 (2) (A) in the amount of $5,000.00, conditioned upon performance of the obligations contained in the aquaculture lease documents and all applicable statutes and regulations.

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).[5] 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.

[5] 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."

The following conditions shall be incorporated into the lease:

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

b. Other public uses that are not inconsistent with the purposes of the lease are permitted within the lease boundaries.

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: September 1, 2016

Patrick C. Keliher, Commissioner,
Department of Marine Resources

TOWN OF BAR HARBOR
Manager's Office
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RECEIVED
JUN 26 2015
Maine Department of Marine Resources

Cornell F. Knight Town Manager email: manager@barharbormaine.gov

June 24, 2015

Diantha C. Robinson
Aquaculture Hearing Officer
21 State House Station
Augusta, ME 04333-0021

Dear Ms. Robinson:

I am writing in response to your letter of June 5th requesting comments from the Town of Bar Harbor on the aquaculture lease application. The Bar Harbor Town Council is in support and endorses the Bar Harbor Oyster Company's application pending before the Department of Marine Resources. No negative comments were made during this discussion item at the Council's meeting last week. The town's Marine Resources Committee also reviewed the application and had no issues with the project. The town's Harbormaster will send the survey questionnaire to you under separate cover.
This project will support a few full time and seasonal jobs and is a clean ocean industry with good growth potential.

We hope it is successful and that you look favorable upon the application. Please call with any questions.

Sincerely,

Cornell Knight
Town Manager

EXHIBIT
DMR
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tabbies'
Lt. Town of BH

"Friends of Thomas Bay"

The group, "Friends of Thomas Bay", is being established to hire legal counsel to explore the impact and mount a defense pertaining to the proposed aquaculture lease to grow American and European oysters on a 25-acre site to be located in Thomas Bay in the Town of Bar Harbor, Maine.

____ YES, PLEASE INCLUDE ME AS A MEMBER OF THE GROUP

____ NO, I DO NOT WISH TO BE A MEMBER OF THE GROUP

____ I AM UNDECIDED, PLEASE CONTACT ME WITH ADDITIONAL INFORMATION

Name:_____

Signature:_____

Mailing Address:_____

Thundermist Road Address:_____

Contact Information: (Telephone)_____

(Email)_____

Comments:_____

Please mail completed and signed form to:

Peter Richardson, 139 Thundermist Road, Bar Harbor, ME. 04609

FRIENDS OF THOMAS BAY: MEMBERSHIP

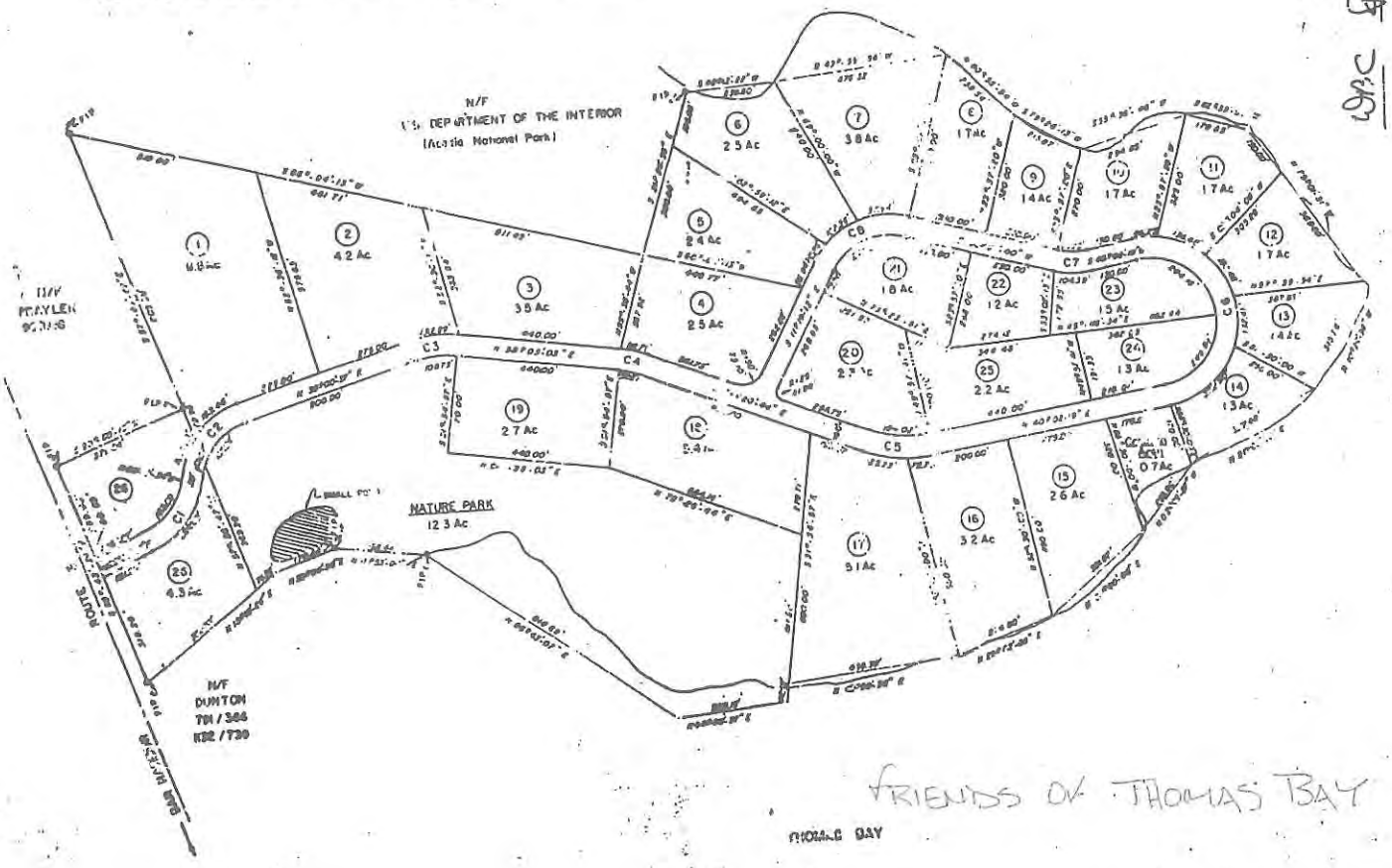
1. Joseph Blanchette (Lot #1 at 26 Thundermist Road)
2. Deborah & Michael Dixon (Lot #5 at 191 Thundermist Road)
3. Abigail Smith (Lot #6 at 185 Thundermist Road)
4. Rebecca Richardson (Lot #10 & #21 at 157 & 180 Thundermist Road)
5. Paul & Patty Keller (Lot #11 at 151 Thundermist Road)
6. Bert & Leigh Roberts III (Lot #12 at 143 Thundermist Road)
7. Peggy & Peter Richardson (Lot #13 at 139 Thundermist Road)
8. Jennifer LaFleur (Lot #14 & #24 at 133 Thundermist Road)
9. John Maxwell (Lot #15 & #16 at 107 & 117 Thundermist Road)
10. Paul Richardson (Lot #18 & #23 at 79 & 150 Thundermist Road)
11. Thomas & Joan Tukey (Lot #20 at 94 Thundermist Road)
12. Glenn Milligan & Michele Daley (Lot #22 & #25 at 110 & 166 Thundermist)

The list of members represent 17 of the total 26 lots of the Thundermist Road Subdivision

FRIENDS OF THOMAS BAY: MEMBERSHIP

Lot #1 at 26 Thundermist Road:	Joseph & Kristin Blanchette 26 Thundermist Road, Bar Harbor, ME. 04609
Lot #5 at 191 Thundermist Road:	Deborah & Michael Dixon 1053 Seahawk Lane, Sanibel, FL. 33957
Lot #6 at 185 Thundermist Road:	Dr. Abigail Smith 596 Rock Raymond Road, Downingtown, PA. 19335
Lot #10 at 157 Thundermist Road & Lot #21 at 180 Thundermist Road:	Rebecca Richardson 157 Thundermist Road, Bar Harbor, ME. 04609
Lot #11 at 151 Thundermist Road:	Paul & Patricia Keller 444 West Sunset Road, Barrington, IL. 60010
Lot #12 at 143 Thundermist Road:	Bert & Leigh Roberts III 8850 Blue Sea Drive, Columbia, MD. 21046
Lot #13 at 139 Thundermist Road:	Peggy & Peter Richardson 139 Thundermist Road, Bar Harbor, ME. 04609
Lot #14 at 133 Thundermist Road & Lot #24 at 128 Thundermist Road:	Blake Family Real Estate Trust, Jennifer LaFluer 5 Chelsea Way, Stratham, NH. 03885
Lot #15 at 117 Thundermist Road & Lot #16 at 107 Thundermist Road:	Dr John & Lynette Maxwell 12817 Hacienda Ridge, Austin, TX. 78738
Lot #18 at 79 Thundermist Road & Lot #23 at 150 Thundermist Road:	Paul Richardson 62 Otter Creek Drive, Otter Creek, ME. 04660
Lot #20 at 94 Thundermist Road:	Thomas & Joan Tukey PO Box 904, Mount Desert, ME. 04660
Lot #22 at 166 Thundermist Road & Lot #25 at 110 Thundermist Road:	Dr. Glenn Milligan & Michele Daley 110 Thundermist Road, Bar Harbor, ME. 04609

"THUNDERMIST"
BAR HARBOR, MAINE

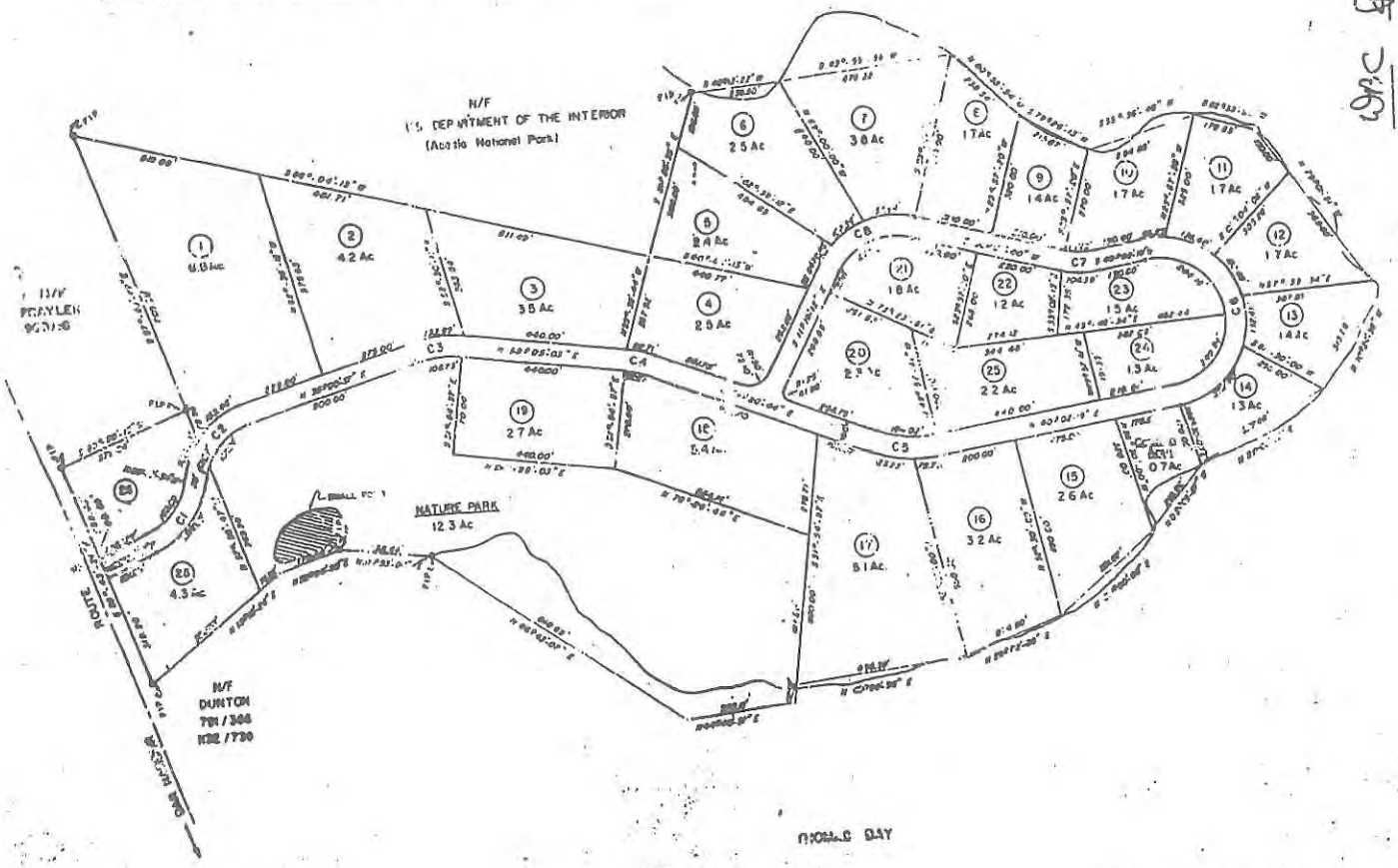


FRIENDS OF THOMAS BAY

THOMAS BAY

"THUNDERMIST"

BAR HARBOR, MAINE



From: Sally Mills
To: Dean, Hannah
Subject: Re: Follow up on Information Request Re: Bar Harbor Oyster LLC Application, July 28th Hearing
Date: Thursday, July 14, 2016 5:52:24 PM
Attachments: Information on Friends of Thomas Bay.pdf
Resume - Joseph DeAlteris.docx

This message was sent securely using ZixCorp.

Hannah,

I attach a packet of information about the Group. They have not kept formal minutes, but I included their form for people to sign up to the group, fyi.

I also attach the current membership list with the tax map. The Group is basically a sub-set of the homeowners' association (there is a common lot at Lot 17 which allows access to the shore). The members are either strictly riparian owners, or live in close proximity and have access via Lot 17.

We are still not sure how many from the Group will be able to attend, but estimate five to six at this stage. Their testimony will either focus on their concerns to navigate the site (with kayaks, etc - there are no commercial fishermen in the Group) or their concerns about noise and light. It will be factual/use testimony; not expert. So I have not included any resumes for the members. I do not anticipate any lengthy testimony. I have cautioned them to stay on point and refer to the criteria.

The expert who will speak to the criteria is Dr. Joseph DeAlteris. I attach his resume. He will testify about environmental concerns about the site and noise and light. He may also testify regarding appropriate lease conditions in the event the application is granted [I will circulate those proposed conditions ahead of time to you and the applicant].

Jane Disney from MDI Biological Labs is not our witness, but I understand she plans to attend. I will try and get a resume for her to you.

I hope this will do the trick for your purposes but just let me know if you need anything further.

If the Intervenor Application for the Group is approved, I anticipate we would withdraw the application for Rebecca Richardson individually.

Thank you,

Sally

Sally N. Mills, Esq.
Hale & Hamlin, LLC
PO Box 729
Four State Street
Ellsworth, ME 04605
Tel: 207-667-2561
Fax: 207-667-8790

On Thu, Jul 14, 2016 at 12:28 PM, Dean, Hannah <Hannah.Dean@maine.gov> wrote:

This message was sent securely using ZixCorp.

Hi Sally,

I wanted to see if you have the lists of members and their expertise available for Friends of Thomas Bay, any minutes/procedural information on the nature/expertise of the association, and a description of Rebecca's expertise (such as a resume).

I'd like to complete a decision on intervenor status on both applications as soon as possible, but will need that information in order to do so.

Let me know if you might be able to provide that today or tomorrow.

Thanks for your help with this.

Sincerely,

Hannah Dean

Regulations Officer/Aquaculture Hearings Officer

Maine Department of Marine Resources

(207)624-6573

This message was secured by ZixCorp(R).

Revised 1 September 2012

JOSEPH DEALTERIS

DeAlteris Associates Inc.:

24390 Mariner's Landing
P.O. Box 366
Onancock, VA 23417

University of Rhode Island:

Dept. of Fisheries & Aquaculture
East Farm, Building 50
Kingston, RI 02881

757-787-5637 (Office) 401-874-5333 (Voice) 401-741-1129 (mobile) 401-874-7153 (FAX) jdealteris@uri.edu (E-mail)

Education:

B.A., 1968, Natural Science (Marine Biology)
Rutgers, The State University, New Brunswick, New Jersey

M.A., 1973, Marine Science (Coastal Processes),
Virginia Institute of Marine Science,
College of William and Mary, Gloucester Point, Virginia

Ph.D., 1986, Marine Science (Estuarine Processes),
Virginia Institute of Marine Science,
College of William and Mary, Gloucester Point, Virginia

Military Service:

1969-1972, U.S. Navy Reserve, served aboard submarines, retired reserve rank, Lieutenant

Prior Employment:

2013 Kingston, R.I.	Univ. of Rhode Island	Professor Emeritus
1990-2012 Kingston, R.I.	Univ. of Rhode Island	Professor
1989-1995	Univ. of Rhode Island Kingston, R.I.	Associate Professor
1983-1989	Univ. of Rhode Island Kingston, R.I.	Assistant Professor

1977-present	DeAlteris Associates Inc. Jamestown, R.I.	Consultant
1977-1983	DeAlteris Enterprises	Commercial Fishing, Boat Building
1975-1977 Dames and Moore	Pandullo Quirk Assoc. Project Oceanographer	Senior Oceanographer 1973-1977
1972-1973 of Marine Science	Virginia Institute	Marine Scientist
1969-1972	U.S. Navy	Lieutenant on submarines
1968-1969 of Marine Science	Virginia Institute	Computer Programmer
1967-1968	Sandy Hook Marine Lab.	Diver Technician

Certifications and Licenses:

Certified Professional Geologist #000120, 1984 Virginia Board of Geology.

Certified Scuba Diving Instructor, #1355 National Association of Underwater Instructors. 1969 to 2006.

Certified working diver, 1985-1995. NOAA, National Marine Fisheries Service.

U.S. Coast Guard Licensed Captain, vessels to 100 tons, operating to 100 miles offshore, all coasts of U.S., 1968 to present.

Professional Society Memberships:

American Fisheries Society

Honors and Awards:

Inducted Phi Eta Sigma, National Honor Society, at University of Rhode Island in 1996 for scientific leadership in the aftermath of the North Cape Oil Spill

American Fisheries Society award in Sept 2010 as co-author of best paper in 2009 in North American Journal of Fisheries Management. Citation: Reich, D. and J. DeAlteris. 2009. A simulation study of the effects of spatially complex population structure in Gulf of Maine Atlantic cod. Transactions of North American Journal of Fisheries Management. 29:116-126.

Academic Activity:

Courses taught 1995-present

AFS 101	Introduction to Fisheries and Aquaculture
AFS 200	Introduction to Marine Science and Technology
AFS 270	Introduction to SCUBA Diving in Science and Technology
AFS 312	Marine Fish Habitats and the Impacts of Fishing
AFS 321	World Fishing Methods
AFS 332	Interactions between Protected Species and Fisheries
AFS 421	Theory of Fish Harvesting and Sampling Gear Design
AFS 433	Research Diving Methods
AFS 521	Evaluation Fish Harvesting and Sampling Systems
AFS 510	Quantitative Methods in Marine Fisheries Ecology
AFS 531	Fish Stock Assessment
AFS 584	Advanced Aquacultural Engineering
AFS 591	Incorporating Uncertainty into Ecological Models

Major Professor for more than 40 M.S. and Ph.D. graduate students in the last thirty years.

Professional Service:

Appointed to Atlantic Scientific Review Group for reauthorized of Marine Mammal Protection Act., 1996 to present, elected Chair of the ASRG 2008 to 2010

Appointed to NMFS - Marine Mammal Take-Reduction Team for fisheries interacting with offshore cetaceans, 1996-2001.

Appointed to NMFS Marine Mammal Take-Reduction Team for fisheries interacting with Mid-Atlantic harbor porpoise, 1996-present.

Appointed to NMFS Marine Mammal Take Reduction Team for fisheries interacting with Mid-Atlantic bottlenose dolphin, 2001-present

Appointed to New England Fishery Management Council. Habitat Technical Committee, 1998-2003.

Appointed to National Research Council Committee to review the effects of fishing on marine ecosystems, 2000-2002.

Appointed to National Research Council Committee to review opportunities for cooperative research at the NMFS with the fishing industry, 2002-2003.

Appointed to joint New England Fishery Management Council and Mid-Atlantic fishery Management Council Technical Committee for the NMFS NEFSC trawl survey, 20032008.

Appointed to the New England Fishery Management Council Habitat Plan Development Team 2004-2006.

Appointed to the Atlantic States Marine Fisheries Commission Committee of Fishing Gear, and elected Chair of the committee 2007-2010

Refereed Articles:

DeAlteris and Byrne, 1975. The recent history of Wachapreague Inlet, Virginia. In: Estuarine Research, J. Cronin, Editor, Academic Press, New York, pp. 167-182.

DeAlteris and Keegan, 1977. Advective transport processes related to the design of wastewater outfalls along the Southern New Jersey coast. In: Transport Processes in Lakes and Oceans, R.J. Gibbs, Editor, Plenum Press, pp. 63-90.

Haven, Ziegler and DeAlteris, 1987. Comparative attachment, growth and mortality of oyster spat, Crassostrea virginica on slate as contrasted to that on oyster shells in the James River. Journal of Shellfish Research, Vol. 6, No. 2, pp. 45-58.

DeAlteris, 1988. The geomorphic development of Wreck Shoal, a subtidal oyster reef of the James River, Va., Estuaries, Vol. 11, No. 4, pp 240-247.

DeAlteris, 1988. The application of hydroacoustics to the mapping of subtidal oyster reefs. Journal of Shellfish Research, Vol. 7, No. 1, pp. 41-45.

DeAlteris, 1989. The role of bottom current and estuarine geomorphology on the sedimentation processes and productivity of Wreck Shoal, an oyster reef of the James River, Va. In: Estuarine Circulation, B. Nielsen, Editor, Humana Press, pp. 278-307.

DeAlteris, and others, 1989. Comparison of the performance of two bottom sampling trawls. Transaction of American Fisheries Society, Vol. 118, pp 119-130.

Castro, DeAlteris and others, 1988. Resource assessment of Portunid crabs in Ecuador. Journal of Shellfish Research. Vol. 7, No. 3, pp 414-419.

DeAlteris, and others, 1988. Alternative treatments to prevent the biodeterioration of offshore wood lobster traps by the wood-boring bivalve, Xylophaga atlantica. Journal of Shellfish Research, Vol. 7, No. 3, pp 445-451.

Castro and DeAlteris, 1990. Effects of trap saturation and species interaction on the capture of Callinectes spp crabs in the Guayas Estuary, Ecuador. Fisheries Research, Vol. 8, pp. 223-332.

Romey, Castro, DeAlteris, and Bullock, 1990. Recruitment in the deep-sea wood-boring bivalves. Xylophaga atlantica. Veliger. Vol. 34, No. 1, pp. 14-20.

Buxton and DeAlteris, 1992. Quantification of water flow and net drag in midwater trawls. Fisheries Research, 16:165-178.

DeAlteris and Reifsteck, 1992. Escapement and survival of fish from the cod-end of a demersal trawl. Fish behavior in relation to fishing operations. I.C.E.S. Marine Science Symposium. Vol. 196, pp. 128-131.

Romey, Bullock and DeAlteris, 1994. Rapid growth of a deep-sea wood-boring bivalve. Continental Shelf Research, Vol. 14, No. 12, pp. 1349-1359.

Riedel and DeAlteris, 1995. Factors affecting hydrodynamic performance of the Nordmore Grate System: bycatch reduction device used in the Gulf of Maine shrimp fisheries. Fisheries Research, Vol. 24, pp. 181-198.

DeAlteris and Riedel, 1996. Effect of size selection within and between fishing gear types on the yield and spawning stock biomass per recruit for a cohort of an idealized groundfish. Journal of Northwest Atlantic Fishery Science, Vol. 19, pp. 73-82.

DeAlteris and Castro, 1996. Recent progress in the development of selective trawls for demersal fisheries. Proceedings of World Fisheries Congress. Fisheries Resource Utilization and Policy. Meyer and Zhang (Editors). Oxford Publishing, pp. 240-249.

DeAlteris and Morse, 1997. Fishing Gear Management, pp. 165-173. In: Northwest Atlantic Groundfish: Perspectives on a Fishery Collapse. Ed. R. Kendall, Amer. Fish. Soc., Washington, D.C.

DeAlteris, Milliken and Morse, 1997. Bycatch reduction in the Northwest Atlantic small mesh bottom trawl fishing for silver hake (Merluccius bilineris), pp. 568-573. In: Developing and Sustaining World Fisheries Resources. Eds. Hancock, Smith, Grant, and Beumer. CSIRO. Australia

DeAlteris, Skrobe, Lipsky, 1999. Seabed disturbance by mobile fishing gear relative to: a case study in Narragansett Bay, R.I. Ed. L. Benaka, American Fisheries Society Symposium Series 22:224-239, Washington, D.C.

DeAlteris and LaValley, 1999. Physiological response of scup, Stenotomus chrysops. to a simulated trawl capture and escape event. Journal of Marine Technology Society. 33(2):25-34.

DeAlteris, Skrobe and Castro, 2000. Effects of fishing on biodiversity and habitat in offshore New England waters. In: History, status and Future of the New England Offshore Fishery. Special Issue of Northeastern Naturalist. 7(4) 379:394.

Appleyard and DeAlteris. 2001. Modeling the growth of the Northern quahog, Mercenaria mercenaria. Journal of Shellfish Research 20 (3): 1117-1125.

Appleyard and DeAlteris. 2002. The growth of the Northern quahog in an experimental upweller. Journal of Shellfish Research 21(1): 3-13.

French, Peterson, DeAlteris and Catena. 2003. Restoration that targets function as opposed to structure: replacing lost bivalve production and filtration. Marine Ecology Progress Series. 264:197-212.

Milliken and DeAlteris. 2004. Development of a large mesh panel to reduce the flatfish bycatch in the small mesh bottom trawls used in the New England silver hake fishery. North American Journal of Fisheries Management. 24:20-32.

DeAlteris and Kilpatrick. 2004. Habitat value of shellfish aquaculture gear as compared to eel grass beds and barren bottom. Journal of Shellfish Research, Vol. 23, No. 3, pp. 866-874.

DeAlteris, 2005. Alternative paradigm for the protection of essential fish habitat based on availability and vulnerability. In: Benthic Habitats and the Effects of Fishing, Barnes and Thomas Eds., pp. 785-795, American Fisheries Society, Md.

DeAlteris, Englert and Burnett. 2006. Assessment of trends in fish abundance in Mount Hope Bay relative to Narragansett Bay. Northeastern Naturalist. Vol. 13, No. 4, PP 95-116.

Resma, DeAlteris and Rice. 2006. Size selectivity of purse seines in the Southern Philippines multi-species tuna fisheries. Journal of Aquatic Science, Vol. 3:1-21.

LaValley, DeAlteris, and others. 2008 North Atlantic *Vibrio vulnificus* surveillance from postharvest oysters at a US shellfish processing facility. Journal of Food Service. Volume 19, No. 4, pp.234–237.

LaValley, DeAlteris and others/ 2009. Bacterial Community Profiling of the Eastern Oyster (*Crassostorea virginica*): Comparison of Culture-Dependent and Culture-Independent Outcomes. Journal of Shellfish Research. 28(4):827-835.
Reich, D. and J. DeAlteris. 2009. A simulation study of the effects of spatially complex population structure in Gulf of Maine Atlantic cod. Transactions of North American Journal of Fisheries Management. 29:116-126.

Politis and DeAlteris. 2011. Effect of sea-state on the physical performance of a survey bottom trawl. Fisheries Research Vol 123-124. Pp. 26-36. .

Silva and DeAlteris. 2011. Evaluation of a pound net leader designed to reduce sea turtle bycatch. Marine Fisheries Review. Vol. 73, No. 3., pp. 36-45.

Lawson, DeAlteris, and others. 2012. Evaluation of turtle excluder devices (TEDS) in two U.S. mid-Atlantic trawl fisheries. Submitted to Fisheries Research.

Books:

Steele, DeAlteris and others. 2002. Effects of Fishing on Habitat. National Research Council. 145p.

Hilborn, DeAlteris and others. 2003. Opportunities for Cooperative Research between the NMFS and the Fishing Industry. National Research Council. 95p.

Book Reviews:

DeAlteris, 1988. Fisheries technologies for developing countries, a report by the Office of International Affairs, National Research Council. Journal of the Marine Technology Society, Vol. 23, No. 3, p. 47.

Thesis and Dissertation:

DeAlteris, 1973. A study of a tidal inlet, Wachapreague, Virginia, an unpublished Masters Thesis presented to the College of William and Mary, 86 p.

DeAlteris, 1986. The sedimentary processes and geomorphic history of Wreck Shoal, an oyster reef of the James River, Va. an unpublished Doctorate Dissertation presented to the College of William and Mary, 196 p.

Manuals and Handbooks:

DeAlteris, 1986. Bottom Trawl Construction Manual. Published by URI, Marine Advisory Service, Sea Grant, 69 p.

DeAlteris, 1986. Bottom Trawl Repair Manual. Published by URI, Marine Advisory Service, Sea Grant, 39 p.

DeAlteris and Castro, 1989. Practical Twinework for Fisheries Technologists. International Center for Marine Resource Development, URI. 160 p.

Castro and DeAlteris, 1990. Atlantic Coast Fishing Vessel Safety Manual. Published by Department of Fisheries, URI. 303 p.

Castro and DeAlteris, 1992. Fishing vessel safety curriculum guides. Published by Department of Fisheries, URI. 210 p.
DeAlteris, 1998. Training Manual in Fishery Science and Technology for NOAA Corp Officers. Published by NOAA Corp., Washington, D.C. 167 p.

DeAlteris and Skrobe, 1999. Fundamentals of Quantitative Fish Stock Assessment. URI Fisheries Technical Publications 99-1. 180 p.

DeAlteris, 2000. Quantitative methods in fish stock assessment with EXCEL exercises. In: Brust and Skrobe (Eds.), Stock Assessment Users Manual. 9 chapters, Atlantic States Marine Fisheries Commission. Washington, D.C.

DeAlteris. 2008. Design and performance evaluation of commercial fishing and scientific sampling gears. 12 chapters.

DeAlteris, 2009. Stock Assessment Users Manual. (revised edition) In: Campfield and DeAlteris (Eds.), 9 chapters, Atlantic States Marine Fisheries Commission. Washington, D.C.

Abstracts and Papers Read at Professional Meetings:

DeAlteris and Byrne, 1973. A geological control of a natural inlet, a presentation at the Northeast Section Meeting of the Geological Society of American, Allentown, Pa., N.E.S.M., Geological Society of America, Vol. 5, No. 2, p. 155.

DeAlteris and Byrne, 1973. The recent history of Wachapreague Inlet, presented at the Second International Estuarine Research Conference, Myrtle Beach, South Carolina.

Byrne and DeAlteris, 1974. Channel stability in a tidal inlet, presented at the Fourteenth Coastal Engineering Conference, American Society of Civil Engineers, Copenhagen, Denmark.

DeAlteris, McCown, and Roney, 1974. Current measurements on shallow continental shelf environment, a presentation at an American Geophysical Union Topical Conference, Transport Mechanisms in the Nearshore Environment, Mystic, Connecticut.

DeAlteris, Carr, Roney, and Stahl, 1975. A sediment transport study, offshore, New Jersey, a presentation at Civil Engineering in the Oceans III, Newark, Delaware.

DeAlteris and Byrne, 1975. Possible evidence of late Quarternary uplift in the area of Wachapreague Inlet, Virginia, a presentation of the Northeast Section Meeting of the Geological Society of America, Washington, D.C., N.E.S.M., Geological Society of America, Vol. 7, No. 1, p. 47.

DeAlteris and Vespucci, 1975. Late Quarternary stratigraphic sequence of Little Egg Inlet, New Jersey, a presentation of the Northeast Section Meeting of the Geological Society of America, Washington, D.C., N.E.S.M., Geological Society of America, Vol. 7, No. 1, p. 129.

DeAlteris, 1975. Sea floor dynamics of the inner continental shelf, offshore New Jersey, a presentation at the Assateague Shore and Shelf Workshop, Gloucester Point, Virginia.

DeAlteris, 1976. A speculative model for the evolution of a barrier island, tidal inlet-lagoonal system coastline, a presentation at the Northeast Section Meeting, Geological Society of America, N.Y., N.Y., N.E.S.M., Geological Society of America, Vol. 8, No. 2, p. 159.

DeAlteris, 1976. Beach Haven and Little Egg Inlets, a case study, a presentation of Fifteenth Coastal Engineering Conference, American Society of Civil Engineers, Honolulu, Hawaii.
Mehta, Byrne and DeAlteris, 1976. Measurement of bed friction in tidal inlets, a presentation at the Fifteenth Coastal Engineering Conference, American Society of Civil Engineers, Honolulu, Hawaii.

McKinney and DeAlteris, 1976. Offshore sedimentary processes and responses near Beach Haven and Little Egg Inlets, New Jersey, a presentation at the Fifteenth Coastal Engineering Conference, American Society of Civil Engineers Honolulu, Hawaii.

DeAlteris and Keegan, 1976. An oceanographic study for wastewater outfalls along the Southern New Jersey Coast, a presentation at the Eighty-second National Meeting of the American Institute of Chemical Engineers Conference, Atlantic City, New Jersey, p. 48.

DeAlteris, Sharabani and Keegan, 1976. Nearshore current measurements off Cape May County, New Jersey, a presentation, Fall Meeting of Atlantic Estuarine Research Society.

DeAlteris, 1977. Dynamics of the coastal boundary waters off Southern New Jersey, a presentation at the Hydraulics of the Coastal Zone Conference, American Society of Civil Engineers, College Station, Texas.

Roney, McKinney and DeAlteris, 1977. Erosion Prediction for offshore nuclear power plants: a presentation at the Coastal Sediments '77 Conference, San Francisco, Ca.

Keegan, Konrad, Kroll and DeAlteris, 1977. Nearshore dispersion characteristics determined from drogue data, a presentation at 50th Anniversary Conference, Water Pollution Control Federation, Philadelphia, Pa.

DeAlteris, 1985. The role of the tidal currents and the geomorphology of the estuary on the sedimentation processes and productivity of Wreck Shoal, an oyster reef of the James River, Virginia, a presentation at Symposium on Circulation Patterns in Estuaries Williamsburg, Virginia.

Ziegler, Haven, and DeAlteris, 1985. Oyster spatfall on slate planted in the James River, a presentation at the Atlantic Estuarine Research Society Annual Meeting, Virginia Beach, Va.

DeAlteris, 1986. Fisheries technology programs at the University of Rhode Island, a presentation at the International Fisheries Conference, Rimouski, Canada.

DeAlteris and Castro, 1986. Preliminary observations on the Portunid crab resources of Ecuador, a presentation at the Portunid Ecology Workshop of the Smithsonian Institution, Washington, D.C.

Castro and DeAlteris, 1987. The development of a swimming crab fishery in Ecuador, a presentation at the Tropical and Sub Tropical Fisheries Conference, Orlando, Fla.

DeAlteris and Recksiek, 1988. The performance of estuarine scientific sampling trawls. NE Section Meeting, American Fisheries Society.

Recksiek and DeAlteris, 1988. The catchability of estuarine scientific sampling trawls. NE Section Meeting, American Fisheries Society.

DeAlteris, Wing, and Christensen, 1988. Bottom trawl performance: models versus prototypes. A presentation at the World Symposium on Fishing Gear Design and Performance, Newfoundland, Canada. p. 73.
Castro and DeAlteris, 1988. Methodologies for the development of a new fishery: a case study, swimming crabs in Ecuador. A presentation at the World Symposium on Fishing Gear Design and Performance, Newfoundland, Canada. p. 38.

DeAlteris and Reifsteck, 1988. Selectivity of codends on scup, Stenotomus chrysops in Narragansett Bay, and the survivability of codend escapees: a preliminary report. A presentation at the World Symposium of Fishing Gear Design and Performance, Square Mesh Workshop, Newfoundland, Canada.
Reifsteck and DeAlteris, 1989. Survival of codend escapees: methodology and results. 119th Annual Meeting of the American Fisheries Society, Anchorage, Alaska.

DeAlteris, Wing, and Castro, 1989. The fishing vessel safety training program of the University of Rhode Island, USA. A presentation at Safety and Working Conditions Aboard Fishing Vessels, Rimouski, Canada.

Reifsteck and DeAlteris, 1990. An evaluation of an experimental methodology for investigating the behavior and survival of bottom trawl cod-end escapees. A presentation of the Conservation Engineering Workshop, Narragansett, R.I.

Castro and DeAlteris, 1990. The effect of mesh size in the body of a bottom trawl on the catch retained in the codend. A presentation at the Conservation Engineering Workshop, Narragansett, R.I.

DeAlteris and Castro, 1990. Evaluation of fishing gear performance based on catch comparisons: experimental designs and data analysis methods. A presentation at the Conservation Engineering Workshop, Narragansett, R.I.

Sparsis and DeAlteris, 1992. Effects of disturbance on the estuarine benthic environment in Narragansett Bay, R.I., U.S.A. A presentation of the Benthic Ecology Conference, Newport, R.I.

Castro and DeAlteris, 1992. Development of a methodology for the quantification for fish behavior in the vicinity of a bottom trawl. A presentation at the ICES International Symposium on Fish Behavior in Relation to Fishing Operations, Bergen, Norway.

DeAlteris and Riefsteck, 1992. Escapement and survival of fish from the cod-end of a demersal trawl. A presentation at the ICES International Symposium on Fish Behavior in Relation to Fishery Operation, Bergen, Norway.

DeAlteris and Castro, 1992. Recent progress in the development of selective trawls for demersal fisheries in the Northwest Atlantic. A presentation at the World Fisheries Congress, Athens, Greece.

Morse, DeAlteris and Christensen, 1992. A preliminary analysis of bottom trawl performance comparisons: models versus prototypes. A presentation at Marine Technology Society '92, Washington, D.C.

Harris and DeAlteris, 1992. Preliminary analysis of selectivity of 14.0 cm (5.5 in) and 15.2 cm (6.0 in.) square and diamond mesh cod-ends for yellowtail flounder in New England commercial bottom trawls. A presentation at Marine Technology Society '92, Washington, D.C.

Lazar and DeAlteris, 1992. A preliminary analysis of the demersal gillnet fishery in the Gulf of Maine and adjacent waters. A presentation at the Marine Technology Society '92, Washington, D.C.

Riedel and DeAlteris, 1992. A preliminary analysis of funnel design relative to the optimization of the Nordmore Grate System: a by-catch reduction device used in Gulf of Maine shrimp fishery. A presentation at Marine Technology Society '92, Washington, D.C.

Milliken, DeAlteris, and Castro, 1992. Underwater video camera and recording system for observing fishing gear performance. A presentation at Marine Technology Society '92, Washington, D.C.

Castro, DeAlteris, and Milliken, 1992. The application of a methodology to quantify fish behavior in the vicinity of demersal trawls in the Northwest Atlantic, U.S.A. A presentation at Marine Technology Society '92, Washington, D.C.

DeAlteris, Morse, Carr, Milliken and Castro, 1993. Evaluation of bycatch reduction technologies in the small mesh trawl fisheries in the Northwest Atlantic Ocean. A presentation at the annual A.F.S. meeting, Portland, Oregon.

DeAlteris and Riedel, 1993. Effect of age specific fishing mortality between and within gear types on the yield of spawning stock biomass per recruit of an idealized groundfish. A presentation at a NAFO Special Scientific Meeting, Dartmouth, Nova Scotia.

Lazar and DeAlteris, 1993. On the selectivity of sink gillnets in the Gulf of Maine and adjacent waters. A presentation at a NAFO Special Scientific Meeting. Dartmouth, Nova Scotia.

DeAlteris, DeAlteris, Kaiser and Paquette, 1994. Factors affecting the design of a seabed installed instrument housing. A presentation of the Marine Technology Society Annual Meeting, 1994, Washington, D.C.

DeAlteris, Milliken and Morse, 1996. Bycatch reduction in the Northwest Atlantic small mesh bottom trawl fishery for silver hake (Merluccius bilinearis). A presentation at the Second World Fisheries Congress, Brisborne, Australia.

DeAlteris, DeAlteris, Vincent and Kaiser, 1996. A seabed platform for long-term monitoring in the littoral environment. A presentation at the OCEAN 96 Conference. Fort Lauderdale, Fla.

DeAlteris, Castro, Catena, and Arditio, 1997. Relieving the "Bottleneck": an artificial reef for the early life history phase American Lobster, Homarus americanus. A presentation at the Fifth International Conference and Workshop on Lobster Biology and Management. Queenstown, New Zealand.

Klein-MacPhee, Young, DeAlteris and Beutel, 1997. Long-term rearing of juvenile summer flounder (Paralichthys dentatus) at different salinities to enhance growth for aquaculture. American Society of Ichthyologists and Herpetologists. Annual Meeting. Seattle, Washington.

DeAlteris, Beutel, Alves, and Thompson, 1997. Differential growth of American oysters, (Crossostrea virginica) in Narragansett Bay, R.I. Symposium on Marine Finfish and Shellfish Aquaculture. New Hampshire.

Lazar and DeAlteris, 1997. Indirect estimation of gillnet selection: a case study of the New England groundfish gillnet fisheries. NAFO Symposium. "What Future for Capture Fisheries." St. John's, Newfoundland

Kinani, DeAlteris, and Hanumara, 1997. Catchability of fishing gears used in the New England groundfish fishery. NAFO Symposium. "What Future for Capture Fisheries." St. John's, Newfoundland.

Grogan and DeAlteris, 1997. Analysis of yield and spawning stock biomass per recruit for groundfish species in the Northwest Atlantic. NAFO Symposium. "What Future for Capture Fisheries." St. John's, Newfoundland.

DeAlteris, 1997. Bycatch reduction in the Northwest Atlantic Trawl Fisheries: Myth or Reality. Atlantic Fisheries Technology Conference, Newport, R.I.

Williams and DeAlteris, 1998. The operation of inshore fish pots. Winter meeting of Southern New England Chapter of American Fisheries Society.

Skrobe and DeAlteris, 1998. Aspects of sub-legal lobster bycatch in Rhode Island trawl fisheries. Winter meeting of Southern New England Chapter of American Fisheries Society.

Guimond, Fridman, Williams and DeAlteris, 1998. Estimation of the tractive force of large whales. Winter meeting of the Southern New England Chapter of American Fisheries Society.

DeAlteris, Skrobe and Lipsky, 1998. Seabed disturbance by mobile fishing gear: a case study in Narragansett Bay, R.I. American Fisheries Society, annual meeting. Hartford, Conn.

DeAlteris, Beutel, Lipsky, Williams and Lavigne, 1998. Recent progress in the development of Passive-Static Fishing Technologies. Fish Expo. Boston, Mass.

DeAlteris, Williams, Beutel and Thompson, 1998. Differential growth of oysters, Crossostrea virginica, in Narragansett Bay. Rhode Island Aquaculture Conference. Cranston, R.I.

DeAlteris, Thompson, Mauseth and Erickson, 1999. Effect of North Cape Oil spill on the surf clam fishery resource off southern Rhode Island. International Oil Spill Conferences, Seattle, Washington.

DeAlteris, Skrobe and Castro, 1999. Effects of fishing on biodiversity and habitat in offshore New England waters. Conference on the History, Status, and Future of the New England Offshore Fishery. New London, Conn.

DeAlteris, Skrobe and Hammond, 1999. Seabed disturbance by mobile fishing gear relative to natural processes: application of a general model to the southern New England continental shelf. American Fisheries Society, Annual Meeting, Charlotte, N.C.

DeAlteris and Skrobe, 1999. Essential elements of a fishing experiment. NEFMC Small Mesh Experimental Fishery Workshop. Narragansett, R.I.

Skrobe and DeAlteris, 2000. Seabed disturbance by mobile fishing gear relative to natural processes: application of a general model to the Northeast U.S. continental shelf. American Fisheries Society, southern New England Chapter Meeting, Narragansett, R.I.

Appleyard and DeAlteris, 2000. Maximizing the efficiency of hard clam culture in an experimental-scale upweller. Aquaculture America 2000. New Orleans, Louisiana.

Appleyard and DeAlteris, 2000. Modeling the growth of the hard clam. 20th Milford Aquaculture Seminar. Milford, Conn.

Appleyard and DeAlteris, 2000. Hard clam culture in upwellers. Issues and Advances in Aquaculture. Old Lyme, Conn.

DeAlteris, Skrobe, and Gibson, 2000. Fisheries of Rhode Island. BAY SUMMIT 2000. Providence, R.I.

DeAlteris, Skrobe and Caporelli, 2000. Restoring American lobster resource after an oil spill; project implementation and short-term impacts. International Conference on Lobster Biology and Management. Key West, Fla.

Mauseth, Challenger and DeAlteris. 2000. Restoration and compensation of the Rhode Island lobster fishery follows the North Cape Oil Spill International Oil Spill Conference, Seattle Wash.

Kilpatrick, DeAlteris and Rheault. 2002. Assessing the habitat value of modified rack and bag aquaculture gear in comparison with submerged aquatic vegetation. 22nd Milford Aquaculture Seminar. Milford, Conn. and Journal of Shellfish Research 21(1):344.

Kilpatrick, DeAlteris and Rheault. 2002. Habitat value of aquaculture gear. Oyster Reef Restoration Conference, Hilton Head, SC.

Kilpatrick, DeAlteris and Rheault. 2002. Assessing the habitat value of modified rack and bag aquaculture gear in comparison with submerged aquatic vegetation. Journal of Shellfish Research 21(1):344.

DeAlteris and Chosid. 2003. Effects of Increasing the Codend Mesh Size in the Multispecies Fisheries of New England. 59th Annual Fish and Wildlife Conference, Newport, RI. April 13-16 2003.

DeAlteris and Milliken. 2003. Bycatch reduction technologies: from problem identification to implementation. American Fisheries Society Annual Meeting, 10-14 August 2003, Quebec, Canada.

DeAlteris and Chosid. 2003. Effects of increasing codend mesh size in the multispecies fisheries of New England: a cooperative research project. American Fisheries Society Annual Meeting, 10-14 August 2003, Quebec, Canada.

DeAlteris, Englert and Burnett. 2003. Assessment of trends in fish abundance in Mount Hope Bay relative to Narragansett Bay. New England Estuarine Research Society meeting, 8-10 May 2003. Fairhaven, MA.

DeAlteris and Chosid. 2004. Optimizing biological and economic yield from the Georges Bank , mixed species bottom trawl fishery. World Fisheries Congress, Vancouver, CA

Chosid and DeAlteris, 2004. Effects of codend mesh size on the yield of the yied of the multispecies trawl fishery on Georges Bank. AFS northeast and mid-atlantic section meeting, Ocean City Md.

Nordahl and DeAlteris, 2005, A performance comparison of a standard sea scallop dredge with and without rock excluding chains. American Fisheries Society Annual Meeting, Anchorage Ak.

Politis and DeAlteris, 2005, The effects of weather on the performance of the National Marine Fisheries Service Northeast Fisheries Science Center Yankee 36 survey trawl. American Fisheries Society Annual Meeting, Anchorage Ak.

Hovermale and DeAlteris, 2005, Quantifying fish behavior in the mouth of the National Marine Fisheries Service Northeast Fisheries Science Center Yankee 36 survey trawl. American Fisheries Society Annual Meeting, Anchorage Ak.

Silva and DeAlteris, 2005, Reducing pound net and sea turtle interactions in Chesapeake Bay. American Fisheries Society Annual Meeting, Anchorage Ak.

DeAlteris and Burnett, 2005, Trends in fish abundance in Mount hope Bay: Is the Brayton Point Power Station affecting fish stocks? American Fisheries Society Annual Meeting, Anchorage Ak.

Lawson, DeAlteris and others. 2007. Evaluation of turtle excluder devices in tow mid-Atlantic trawl fisheries. American Fisheries Society Annual Meeting, San Francisco, CA.

Riech and DeAlteris. 2007. A simulation study of the effects of spatially explicit complex population structure in Gulf of Maine cod. American Fisheries Society Annual Meeting, San Francisco, CA.

Schroder and DeAlteris. 2007. Effect of a long-term, weekly, fixed station trawl survey on the benthos of Narragansett Bay, RI. American Fisheries Society Annual Meeting, San Francisco, CA.

Reich and DeAlteris. 2008. A simulation study of the effects of spatially complex population structure in Gulf of Maine Atlantic cod. International Council for the Exploration of the Seas (ICES) Annual Meeting in Halifax, NS, Ca.

Non-Refereed Articles:

Byrne and DeAlteris, 1974. Channel stability in a tidal inlet. Proceedings of the Fourteenth Coastal Engineering Conference, American Society of Civil Engineers N.Y., pp. 1585-1604.

DeAlteris, Carr, Roney, and Stahl, 1975. A sediment transport study, offshore, New Jersey. Proceedings at Civil Engineering in the Oceans III, American Society of Civil Engineers, N.Y., pp. 225-244.

DeAlteris, 1976. Beach Haven and Little Egg Inlets, a case study. Proceedings of Fifteenth Coastal Engineering Conference, American Society of Civil Engineers, N.Y., pp. 1881-1898.

Mehta, Byrne and DeAlteris, 1976. Measurement of bed friction in tidal inlets. Proceedings of Fifteenth Coastal Engineering Conference, American Society of Civil Engineers, N.Y., pp. 17011720.

McKinney and DeAlteris, 1976. Offshore sedimentary processes and responses near Beach Haven and Little Egg Inlets, New Jersey. Proceedings of Fifteenth Coastal Engineering Conference, American Society of Civil Engineers, N.Y., pp. 1899-1918.

DeAlteris, 1977. Dynamics of the coastal boundary waters off Southern New Jersey, Proceedings of Hydraulics of the Coastal Zone Conference, American Society of Civil Engineers, N.Y. pp. 82-89.

Roney, McKinney, and DeAlteris, 1977. Erosion prediction for offshore nuclear power plants. Proceedings of Coastal Sediments '77 Conference, American Society of Civil Engineers, N.Y., pp. 867-884.

DeAlteris, 1986. Fisheries technology programs of the University of Rhode Island. Proceedings of the International Fisheries Conference. University of Quebec at Rimouski, Canada, pp. 823-830.

DeAlteris and Castro, 1987. The development of a swimming crab fishery in Ecuador.

Maritimes, a University of Rhode Island, Graduate School of Oceanography publication, Vol. 31, No. 4, pp 5-7.

Castro and DeAlteris, 1987. The development of a swimming crab fishery in Ecuador. Proceedings of the 1987 Tropical and Sub-Tropical Fisheries Conference, Florida Sea Grant College Program, pp. 107-120.

DeAlteris, Bullock, and Romey, 1988. Trapworms, a critical problem for the offshore lobster industry, Maritimes, University of Rhode Island, Graduate School of Oceanography Publication, Vol. 32, No. 2, pp. 14-15.

Castro and DeAlteris, 1988. Methodologies for the development of a new fishery: swimming crabs in Ecuador, a case study. Proceedings of the World Symposium on Fishing Gear Design and Performance, Newfoundland, Canada, pp. 228-231.

DeAlteris and Riefsteck, 1988. Selectivity of cod-ends on scup, Stenotomus chrysops, in Narragansett Bay, and the survivability of cod-end escapees: a preliminary report. Proceedings of the Square Mesh Workshop, Newfoundland, Canada, pp. 38-53.

DeAlteris, Wing, and Castro, 1989. The fishing vessel safety training program at the University of Rhode Island. Proceedings of the International Symposium of Fishing Vessel Safety. Rimouski, Canada, pp. 165-172.

Kenney, Blott, and DeAlteris, 1991. Shrimp separator trawl experiments in the Gulf of Maine shrimp fishery. Proceeding of the Fisheries Conservation Engineering Workshop. R.I. Sea Grant Publication RIU-W-90-002, pp. 6-11.

DeAlteris, Castro and Testaverde, 1991. Effect of mesh size in the body of a trawl on the catch retained in the codend. Proceeding of the Fisheries Conservation Engineering Workshop. RI Sea Grant Publication RIU-W-90-002, pp. 12-18.

Reifsteck and DeAlteris, 1991. A methodology for investigating the behavior and survival of bottom-trawl codend escapees and some preliminary results. Proceeding of the Fisheries Conservation Engineering Workshop. RI Sea Grant RIU-W-90-002, pp. 26-33.

DeAlteris and Castro, 1991. Experimental Designs and Data Analysis Methodology for the Evaluation of Bottom Trawl Performance Based on Catch Comparison. Proceedings of the Fisheries Conservation Engineering workshop. RIU-W-90-0002, pp. 60-70.

Morse, DeAlteris, and Christensen, 1992. A preliminary analysis of bottom trawl performance comparisons: models versus prototypes. Proceedings of Marine Technology Society '92, pp. 322-327.

Harris and DeAlteris, 1992. A preliminary analysis of selectivity of 14.0 cm (5.5 in) and 15.2 cm (6.0 in) square and diamond mesh codends on yellowtail flounder in New England commercial bottom trawls. Proceedings of Marine Technology Society '92, pp. 416-420.

Lazar and DeAlteris, 1992. A preliminary analysis of the demersal gillnet fishery in the Gulf of Maine and adjacent waters. Proceeding of Marine Technology Society '92, pp. 409-414.

Riedel and DeAlteris, 1992. A preliminary analysis of funnel design relative to optimization of the Nordmore Grate System: a by-catch reduction device used in Gulf of Maine Shrimp Fishery. Proceedings of Marine Technology Society '92, pp. 342-346.

Milliken, DeAlteris, and Castro, 1992. Underwater video camera and recording system for observing fishing gear performance. Proceedings of Marine Technology Society '92, pp. 389-393.

Castro, DeAlteris, and Milliken, 1992. The application of a methodology to quantify fish behavior in the vicinity of demersal trawls in the Northwest Atlantic, USA. Proceedings of Marine Technology Society '92, pp. 310-315.

DeAlteris, DeAlteris, Kaiser and Paquette, 1994. Factors affecting the design of a seabed installed instrument housing. Proceedings of Marine Technology Society Annual Meeting, pp. 13-19.

DeAlteris, 1994. Otter Trawling: A Fishery in Transition. Maritimes, University of Rhode Island Graduate School of Oceanography Publication, Vol. 37, No. 1, pp. 20-22.

DeAlteris, DeAlteris, Vincent and Kaiser, 1996. A seabed platform for long-term monitoring in the littoral environment. OCEANS 1996, MTS/IEEE Conference Proceedings, pp. 1237- 1241.

DeAlteris, 1996. The scientific challenge of the North Cape Spill. Maritimes Vol. 38, No. 4, pp. 3-5.

DeAlteris, Thompson, Mauseth and Erickson, 1999. Effects of the North Cape oil spill on the surf clam fishery resource off southern Rhode Island. Proceedings of 1999 International Oil Spill Conference, pp. 993-997.

Mauseth, Challenger, and DeAlteris, 2000. Restoration and compensation of the Rhode Island lobster-fishery following the North Cape oil spill. Proceeding of 2000 International Oil Spill Conference. Pp. 675-679.

Morrison, DeAlteris, Politis and others, Measurement of net-relative flow during a bottom trawl survey. Marine Technology Society, 2004 Annual Oceans Conference. Las Vegas NV.

Unpublished Technical Reports:

DeAlteris and others, 1974-1975, reports written to Public Service Electric and Gas Co. for Dames and Moore related to the design of the breakwater, cooling system and transmission cable alignment for two floating nuclear power plants (Atlantic Generating Station) proposed for Little Egg Harbor, NJ.

Mehta, Byrne and DeAlteris, 1975, Hydraulic constants of tidal entrances III: bed friction measurements at John's Pass and Blind Pass": University of Florida, C.O.E.L., Technical Report Number 26, p 86.

DeAlteris and others, 1975-1976, reports written to the Cape May County Municipal Utilities Authority for Pandullo Quirk Associates related to the site selection and design of three sewer outfalls for Cape May County, NJ

Byrne, Sovich and DeAlteris, 1977. Recent history and response characteristics of Wachapreague Inlet, Virginia, a Virginia Institute of Marine Science Final Report to the Office of Naval Research, Geography Programs, 127 pages plus appendices.

DeAlteris, 1977, Bathymetric Survey and Hydrographic Measurements, Bergen Generating Station, for Public Service Electric and Gas Company

DeAlteris, 1977, The Installation and Maintenance of Tide Gages in the Surf Zone, for NOS, NOAA

DeAlteris, 1978, Waves off Sea Isle City, New Jersey, Winter of 1977-78, for U.S. Army Corps of Engineers.

DeAlteris, 1978, Assessment of Dredging Induced Damage to Private Oyster Grounds in the James River, Virginia, for Crenshaw, Ware and Johnson, Attorneys at Law

DeAlteris, 1979, Results of Pre and Post Dredging Surveys of Selected Oyster Beds in the Back River, Virginia, for the U.S. Army, Corps of Engineers

DeAlteris, 1980, Nearshore Sediment Transport, New Jersey, for AMOL, NOAA

DeAlteris, 1980, Results of Hydrographic Survey of Diamond Shoals Light Tower, North Carolina, for U.S. Coast Guard

DeAlteris, 1980, Results of Macrobenthos and Sediment Survey of Metomkin Bay, Virginia, for U.S. Fish and Wildlife Service

DeAlteris, 1981, Study of the Beach Fauna of a Barrier Island, Duck, North Carolina, for CERC, U.S. Army, Corps of Engineers

DeAlteris, 1981 , Assessment of Damage to Oyster Grounds by Tug and Barge Activity, Back River, Virginia, for Furniss, Davis and Rashkind, Attorneys at Law

DeAlteris, 1981, Results of Pre and Post Dredging Surveys of Oyster Beds in Back River, Virginia, for Corps of Engineers.

DeAlteris, 1981, Evaluation and Appraisal of Selected Oyster Beds in Lynnhaven Canal and Broad Bay, for City of Virginia Beach

DeAlteris, 1982, Assessment of Tug and Barge Damage to Oyster Beds in the Yeocomico River, Virginia, for Hutt and Robertson, Ltd.

DeAlteris, 1982, The Design and Operation of a Multi-Purpose Inshore Trawler in the MidAtlantic Region: a Comparison of Otter, Beam, and pair trawling; for the Mid-Atlantic Fisheries Development Foundation, Inc.

DeAlteris, 1983, Evaluation and Assessment of Oyster and Clam Beds in the Back River, Virginia, for the City of Hamptson, Virginia.

DeAlteris, 1984, Pre and Post Dredging Surveys of Oyster Beds in the vicinity of Broad Creek and the Rappahannock River, Virginia, for the Middlesex County, Va., Board of Supervisors.

DeAlteris, 1985, Evaluation and Assessment of Alleged Damage to Oyster Grounds in the Wicomino River, Md., for U.S.P. and I.

DeAlteris, 1986, Pre and Post Dredging Surveys of Oyster Beds in the Elizabeth River, Va., for Lone Star Cement Co.

DeAlteris, 1986, Evaluation and Assessment of Oyster Beds in the Vicinity of the Proposed Gosnold Hope Park Channel, Back River, Va.; for the City of Hampton, Va.

DeAlteris, 1987, Assessment of the Impact of a Buried Transmission Line on the Oyster Reefs of the Lower York River, Va., for Virginia Power Company.

Diaz and DeAlteris, 1982. Long-term changes in the beach fauna at Duck, North Carolina, a final report to the U.S. Army Corps of Engineers, Coastal Engineering Research Center, CERC, MR No. 82-12, 48 p.

DeAlteris, 1985. A Review of the fisheries technology programs at the School of Fisheries, ESPOL, Guayaquil, Ecuador, ICMRD, URI, 42 p.

DeAlteris and Castro, 1986. Preliminary investigation of the Portunidae crab resources in the coastal and estuarine waters of Ecuador, ICMRD, URI, 28 p.

Castro and DeAlteris, 1988. The development of a swimming crab fishery in Ecuador, ICMRD Technical Report, 116 p.

DeAlteris and Buxton., 1991. Flow in midwater trawl nets as a function of mesh size, twine diameter, webbing taper, and towing speed. Final Report to National Marine Fisheries Service, Woods Hole, Mass.

DeAlteris and Riedel, 1992. Evaluation of factors affecting hydrodynamic performance of the Nordmore Grate System. Final Report to National Marine Fisheries Service, Woods Hole, Mass.

DeAlteris and Morse, 1994. The effects of sweep design on the species selectivity of trawls in the silver hake fisheries of New England. Final Report to National Marine Fisheries Service, Woods Hole, Mass.

DeAlteris, Kaiser and Vincent, 1994. Kwajalein Missile Impact Scanning System (KMISS), Marshall Island. Hydrophone Site Survey Report. Naval Undersea Warfare Center, Division Newport. NUWC Technical Report, 27 p.

Paquette, DeAlteris and DeAlteris, 1994. Environmental factors related to the selection of an underwater sound range on the continental shelf of the East Coast of the United States. Naval Undersea Warfare Center Division Newport, NUWC Technical Report, 80 p.

Paquette and DeAlteris, 1994. Environmental factors related to the selection of a site for an Underwater Sound Range on Tanner and Cortez Banks, California. Naval Undersea Warfare Center, Division Newport, NUWC Technical Report, 64 p.

DeAlteris and DeAlteris, 1994. Design of an instrument housing for use in a shallow water range on the United States continental shelf. Naval Undersea Warfare Center, Division Newport NUWC Technical Report, 54 p.

DeAlteris and Ward, 1995. Ocean circulation simulation model, offshore Onslow Bay, North Carolina. Naval Undersea Warfare Center, Division Newport, NUWC Technical Report, 85 p.

DeAlteris, 1996. Geology of Offshore Onslow Bay, North Carolina, Naval Undersea Warfare Center, Division West Point, NUWC Tech. Report. 46 p.

DeAlteris and DeAlteris, 1996. Results of half scale testing of a trawl resistant seabed mounted instrument housing. Naval Undersea Warfare Center, Division Newport, NUWC, Tech. Report, 35 p.

DeAlteris, 1996-2000. Studies of the impact of the North Cape oil spill on the fishery and aquaculture resources in the southern R.I. area., and the estimation of the restoration of those resources. Numerous reports to Beek Consultants, Polaris Consulting, and West of England.

DeAlteris and others, 1997. Estimation of the tractive force developed by large whales. A report to the National Marine Fisheries Service.

DeAlteris, 1997. Assessment of status of the stock of horseshoe crabs in Delaware Bay. A report to the Delaware Bay Waterman's Association.

DeAlteris, 1998. Assessment of Hard Clam (Mercenaria mercenaria) stocks New Bedford, Dartmouth and Fair Haven, Mass. A report to National Marine Fisheries Service, 34 p.

DeAlteris, 1998. Development of an acoustic release system for bouy lines used in the offshore lobster fishery. A report to the National Marine Fisheries Service, 27 p.

DeAlteris. 2000-2003. Bi-monthly reports on the dispersion and advective transport of fish wastes discharged into Rhode Island Sound. Submitted to EPA, 10-12 pages each

DeAlteris. 2001. Assessment and valuation of damages to oyster grounds in the Yeocamico River, Chesapeake Bay, Va. Report submitted to Bevens Oyster Company, Va. 14 pages.

DeAlteris. 2002-2005. Re-permitting of the Brayton Point Station, a four unit, fossil fuel power plant on Mount Hope Bay RI. Numerous reports summarizing the results of analyses of trends in fish abundance in Mount Hope Bay relative to Narragansett Bay.

DeAlteris, 2004, Results of Sea Turtle and Pound Net Interaction 2004 Project in Chesapeake Bay. A report submitted to NMFS, NEFSC.

DeAlteris, 2005, Results of Sea Turtle and Pound Net Interaction 2005 Project in Chesapeake Bay. A report submitted to NMFS, NEFSC.

DeAlteris, 2006. Results of Sea Turtle and Pot Gear Interaction Assessment in 2006 in Chesapeake Bay. A report submitted to NMFS, NEFSC.

DeAlteris and Lawson. 2007. Evaluation of turtle excluder devices (TEDs) in two U.S midAtlantic trawl fisheries. A report submitted to NMFS, NEFSC.

DeAlteris and others. 2007. Effect of fishing on deep water, marine habitats. A report submitted to FAO, UN. Rome.

DeAlteris and others. 2008. Evaluation of catch performance of a the northeast modified TED in the summer flounder trawl fishery. A report submitted to NMFS, NEFSC.

DeAlteris and others. 2009. Evaluation of the catch performance of the NMFS Flounder TED with a large opening in the Mid-Atlantic scallop trawl fishery. A report submitted to NMFS, NEFSC.

DeAlteris and others, 2010. Evaluation of a topless trawl in the Mid-Atlantic summer flounder bottom trawl fishery. A report submitted to NMFS, NEFSC.

Principal Research Activity:

1967-1968, Bureau of Sport Fisheries, Department of the Interior, employed as lab technician/diver in the construction and monitoring of artificial reefs offshore of the New Jersey coast.

1968-1969, Commonwealth of Virginia, participated in monthly oceanographic cruises in the Mid-Atlantic Bight collecting hydrographic data, also involved in data analysis requiring computer programming.

1969, Deep-sea Ventures, participated in cruises aboard R/V Prospector testing underwater TV and dredging systems for manganese nodules on the Blake Plateau, offshore Florida.

1972-1973, Office of Naval Research, Junior Investigator in a research study of the hydraulics of Wachapreague Inlet, Virginia. Responsibilities included experimental design, designing and planning field operations, including biweekly bathymetric surveys of the inlet gorge, implementation and maintenance of a taut-moor current meter system and the development of an instrument system to measure boundary layer velocity profiles. Data reduction included development and use of specialized computer programs.

1973, Potomac River Fisheries Commission, Diving Consultant, monthly observations of oyster bed response to siltation.

1974-1975, Public Service Electric and Gas Company, Project Manager of the Coastal Process Investigation for the proposed offshore nuclear power plant, the Atlantic Generating Station. Technical studies included an evaluation of current meters in coastal environment, analysis of oceanographic data, sediment transport studies using fluorescent tracers, studies of adjacent beach and inlet evolution, and an investigation into offshore structures similar to the proposed AGS. Responsibilities included management of field work, analysis and budgets, and report writing, annual budget in excess of $500,000.

1973-1975, Dames and Moore, Project Oceanographer. Participated in various projects associated with coastal and estuarine processes in Alabama, Hudson River, Florida, and the Persian Gulf.

1974, University of Florida, Research Consultant, provided instrumentation to measure boundary layer velocity profiles in two tidal inlets on the West Coast of Florida. Also involved in field studies of inception of motion of sediment particles.

1975, Con Edison, Indian Point Nuclear Generating Station, thermal monitoring surveys, dye, and current studies.

1975, Alaska, State Department of Transportation, diving inspections of breakwater construction at the Sitka Alaska Airport Runway Extension Project.

1975-1977, Cape May County Municipal Utilities Authority, Principal Investigator of physical and geological oceanographic studies related to three wastewater outfalls proposed for Cape May County, New Jersey. The physical studies include three systems of insitu current meters and thermographs, monthly hydrographic surveys, drogue studies, dye studies and the collection and analysis of meteorological, wave and tide data. The geological studies include investigations of beach and sea floor stability and a precision bathymetric survey in the vicinity of the proposed outfall alignments. Also peripherally involved in biological and water quality studies. Responsibilities included initial experimental design and defense to EPA, procurement of equipment, implementation and management of field work, management of data analysis, report writing and public presentation. Annual budget in excess of $500,000.

1977, Public Service Electric and Gas Company, precision bathymetric survey and hydrographic measurements, in the vicinity of Bergen Generating Station, New Jersey.

1977, National Ocean Survey, Co-Investigator in tidal datum studies in the North Atlantic region including Cape Cod, Nantucket, and Long Island. Responsible for installation and maintenance of tide observation structures and nitrogen bubble tide gauges in coastal environment for the determination of the boundary of two hundred mile limit. Budget approximate $50,000.

1977, Tetra-Tech Corporation, Water Transport Studies, Jubail Industrial Complex, Saudi Arabia. Consultant: design of drogue and dye investigations in the Persian Gulf.

1977-1978, Coastal Engineering Research Center, U.S. Army, Corps of Engineers, Principal Investigator, wave data collection and analysis, offshore southern New Jersey. Designed and built insitu recording wave gage, installed mooring system, monthly field servicing of gage, computer analysis of data for significant wave height and zero crossing period. Budget approximately $18,000.

1978, National Ocean Survey, Subcontractor to Shore Engineering for installation of nitrogen bubbler tide gages and supporting equipment at Assateague Island, VA and Cape Lookout, NC.

1978, Brown and Root, Subcontract to Normandeau Associates, Inc., installation, service and removal of oceanographic instrumentation, surficial sediment sampling, shallow coring, and patch release dye studies to investigate dispersion and advection at the Cape Charles development site, Chesapeake Bay, Virginia.

1978, Norfolk Dredging Company, assessment of dredging induced damage to private oyster grounds in the James River, Virginia and expert witness testimony in court, on subcontract to Crenshaw, Johnson and Ware, Attorneys at Law, Norfolk, Virginia.

1978, Virginia Institute of Marine Science, Research vessel charter, coastal environmental sampling in the tributaries of Chesapeake Bay by trawl net and grab sampler.

1978-1983, Ecological assessments of dredging and wetlands permits for commercial developments as to potential environmental impact, various locations in Virginia.

1979-1980, Atlantic Meteorological Oceanographic Laboratory, National Oceanographic Atmospheric Administration, Sediment transport study, offshore New Jersey, field data collection, beach profiles, offshore stake fields, sediment samples, statistical data analysis and interpretation. Annual budget approximately $12,000.

1979, U.S. Army, Corps of Engineers, New York District, Hydrographic surveys at various locations, technical consultant and field supervisor on subcontract to Pandullo Quirk Associates.

1979, Virginia Institute of Marine Science, Research vessel charter, technical and diving services coastal environmental sampling to 60 miles offshore, longlining for shark, trawling, neuston and plankton sampling.

1979, Virginia Department of Highways, Pre and post construction environmental inventory of benthic invertebrate communities in the tributaries of Chesapeake Bay, subcontract to the Virginia Institute of Marine Science.

1979-1980, U.S. Geological Survey, Research vessel charter, technical and diving services, water quality surveys, conducting current meter system installation, retrieval and servicing, bottom sediment sampling and coring, in the Potomac River and Chesapeake Bay. Annual Budget approximately $40,000.

1979, National Park Service, Environmental field survey and data analysis, Piscataway Creek, Maryland, related to dredging permits and marina design, subcontract to Anderson Coastal Consultants.

1980, U.S. Coast Guard, Hydrographic Survey of Diamond Shoals Light, North Carolina.

1980, U.S. Fish and Wildlife Service, Macrobenthos and Sediment Survey of Metomkin Bay, Eastern Shore, Virginia.

1980, Virginia Department of Highways, Pre-construction field sampling: survey of commercial shellfish beds, Hampton Roads, Virginia and oyster grounds survey, James River, subcontract to Virginia Institute of Marine Science.

1980, U.S. Environmental Protection Agency, Water quality survey, lower Chesapeake Bay transect, research vessel charter, subcontract to Virginia Institute of Marine Science.

1980, U.S. Coast Guard, Visual diving inspection of Diamond Shoals Light, North Carolina.

1980, Coastal Engineering Research Center, Nearshore and bottom profiles using sea sled and fathometer, Duck, North Carolina, research vessel charter, subcontract to Langley and McDonald Engineers.

1980-1981, Coastal Engineering Research Center, U.S. Corps of Engineers, Study of the Beach Fauna of a Barrier Island, Duck, North Carolina. Total Budget approximately $35,000.

1980, Allied Chemical Corporation, Environmental field sampling in James River, subcontract to Bionomics Group, E.G. and G.

1980-1981, U.S. Fish and Wildlife Service, laboratory analysis of benthic samples, field sampling related to environmental impact studies.

1980-1981, U.S. Navy, Facilities Engineering Command, Hydroid distribution study, Hampton Roads, Virginia, subcontract to Virginia Institute of Marine Science.

1981, Furniss, Davis and Rashkind, Assessment of damage to oyster grounds in Back River by tug and barge activity, field work and expert witness testimony.

1981, U.S. Air Force, Langley Base, Pre and post dredging impact studies, Back River, Virginia.

1981-1982, Mid-Atlantic Fisheries Development Foundation, Inc., Principal Investigator. Comparative fuel efficiency study for pair, otter and beam trawling techniques, funding provided by National Marine Fisheries Service. Total Budget approximately $25,000.

1981, City of Virginia Beach, Evaluation of selected oyster ground lease beds in Lynnhaven Inlet, canal and Broad Bay, related to a proposed dredging project.

1982, U.S. Navy, Facilities Engineering Command, Environmental sampling prior to a dredging project, a subcontract to Froehling and Robertson, Engineers.

1982, Hutt and Robertson, Ltd., attorneys for Bevans Oyster Company, Inc., Assessment of damage to 6 acres of cultivated oyster ground in the Yeocomico River due to tug and barge grounding.

1983, H.B. Kennerly Company, Salisbury, Maryland, Consultant, Evaluation of oyster grounds in the Nanticoke River, Maryland, assessment of damage due to barge grounding.

1983, Avis and Avis, attorneys for Mr. Walter Blount, Consultant Assessment of damage to oyster grounds in the Pagan River, Virginia.

1983, City of Hampton, Consultant, Oyster and clam ground assessment in the SW Branch of the Back River, Virginia, for a pre-dredging condemnation procedure including expert witness testimony in court.

1983, Langley and McDonald Engineers, Consultant, Survey of oyster and clam grounds in the Western Branch of the Elizabeth River, Virginia, re: marina development.

1984-1986, Virginia Institute of Marine Science, Principal Investigator, Doctorate Dissertation Research Project Research in sedimentation processes affecting oyster reefs in the James River, Virginia. Total Budget approximately $50,000.

1983-1987, University of Rhode Island, Department of Fisheries, Principal Investigator, Basic research in mobile fishing gear, physical modeling in tow tanks, visual observations on a sled while SCUBA diving. Supported by URI, AES, and NMFS, for approximately $5,000.

1984, Board of Supervisors, Middlesex County, Virginia, Consultant, pre and post dredging surveys of oyster beds in the vicinity of Broad Creek and the Rappahannock River, Virginia.

1985, U.S.P. and I., Consultant, Assessment of alleged damage to oyster grounds in the Wicomico River, Maryland, caused by commercial river traffic.

1985, Conner, Hooker, Smith and Wright, Attorneys at Law, Consultant Assessment of bottom conditions in the vicinity of the Public Landing at Walden Brothers Marina, Middlesex County, Virginia.

1985, University of Rhode Island, ICMRD, Consultant Review and recommendations of the Fisheries Technology Training Program at ESPOL, Guayaquil, Ecuador. Supported by U.S. AID for approximately $5,000.

1986, Lone Star Cement Co., Norfolk, Va. Consultant, Pre and post dredging surveys of oyster beds in the Elizabeth River, Virginia.

1986, City of Hampton, Consultant, Assessment of oyster beds in the vicinity of a dredging project, Gosnold Hope Park, Back River, Virginia.

1986, City of Newport News, assessment of oyster grounds in the vicinity of a proposed dredging project, James River, Virginia.

1987-1990, Virginia Power Company, Assessment of the impact of a buried transmission line on the oyster reefs of the York River, Virginia.

1988-1990, U.S.P. and I, Consultant, Assessment of alleged damage to oyster grounds in the Wicomico River, Maryland, Caused by commercial river traffic 1988.

1986-1988, University of Rhode Island, ICMRD, Evaluation of the potential for developing a Callinectes crab fishery in the coastal and estuarine waters of Ecuador. Supported by U.S. Agency for International Development, Total budget approximately $40,000.

1987-1989 University of Rhode Island, Evaluation and analysis of the fishing power and energy efficiency of the Rhode Island trawl fishing fleet. Supported by Governors Office of Energy Assistance for $35,000 in 1987-88, Sea Grant for $70,000 in 1987-89, and CRD/AES match for approximately $20,000 1987-1989.

1987-1989, University of Rhode Island, The biology of Xylophaga atlantica and an evaluation of the tolerance of recently settled juveniles to various treatments, supported by Sea Grant for approximately $70,000 in 1987-89, and CRD/AES match for approximately $30,000.

1988-1991, University of Rhode Island, The selectivity of bottom trawl cod-ends and the survivability of escapees. Supported by NMFS, SK $40,753, and by NMFS, N.E. Region for $18,750, and URI Sea Grant for approximately $60,000.

1989-1991, University of Rhode Island, The effect of bottom cultivation on the set, survival and recruitment of the hard clam, Mercenaria mercenaria. Supported by URI Agricultural Experiment Station for approximately $40,000, and URI Sea Grant for about $10,000.

1988-1990, University of Rhode Island, Fishing vessel safety training program. Supported by NMFS-SK for $56,975 and CRD/CES match for $60,000 to develop mobile based training program, rewrite Safety Manual for the Northeast Region and other activity.

1990-1992, University of Rhode Island, Fishing vessel safety training programs development of a standardized training curriculum. Supported by NMFS-SK for approximately $35,000 and industry match for $35,000.

1990-1992, University of Rhode Island. Factors affecting the selectivity of trawls and the survival of codend escapees. Supported by NMFS-SK for $107,000 and URI Sea Grant for $55,000.

1991-1993, University of Rhode Island. Fish behavior in the vicinity of fishing gear. Supported by NMFS-SK for $30,000, URI Sea Grant for $102,000, URI/NOAA CMER, for $25,000, and CRD/AES match of approximately $75,000.

1991-1992, University of Rhode Island. A study of groundfish gillnet fishery in the Gulf of Maine. Supported by the URI/NOAA CMER for $20,000.

1990, New England Fishery Management Council, Design and analysis fishing gear performance evaluation studies.

1990, National Marine Fisheries Service, Design and analysis of shrimp separator trawl experiments.

1991, New England Fishery Management Council. Analysis and interpretation of Canadian trawl selectivity studies with application to the New England groundfish fishery.

1991, National Marine Fisheries Service, Southeast Fisheries Center. Analysis of swordfish catch data with regard to size selectivity of the various gears.

1992-1993, University of Rhode Island. The evaluation of selective trawl designs in the New England small mesh trawl fisheries. Supported by NMFS-SK for $103,169, and CRD match for $47,930.

1993-1997, U.S. Navy, Naval Undersea Warfare Center. Oceanographic studies related to the design of shallow water, acoustically equipped training ranges; design of seabed installed hydrophone mounts; geophysical surveys of shallow and deep acoustic range sites (North Carolina, Florida, Marshall Islands, Hawaiian Islands); scale model and prototype testing of seabed installed hydrophone mounts.

1994-1995, University of Rhode Island. Reduction of flatfish bycatch in the small mesh bottom trawls used in the New England whiting fishery: fish behavior in the vicinity of fishing gear. Supported by NMFS-SK for $84,232 and $15,000 CRD match and $42,000 industry match.

1994, U.S.A.I.D., subcontract to Nathan Associates. Feasibility study on the development of a mid-Atlantic fishing operation base in Cape Verde.

1994-1995, University of Rhode Island. Effects of harvesting gear type and level of fishing mortality on the yield and spawning stock biomass per recruit for commercially important demersal species in the Northwest Atlantic Ocean. Supported by the URI/NOAA CMER Program for $23,000.

1995-1996, University of Rhode Island. Characterization of the Mid-Atlantic Coastal Gillnet Fisheries. Supported by the URI/NOAA CMER Program for $41,000.

1995-1997, University of Rhode Island. Species selectivity in New England groundfish fisheries: behavior of fish and fishers. Supported by R.I. Sea Grant for $58,250, $59,500 and $34,708, and CRD match for $29,500, $29,500, and $17,208.

1996, National Marine Fisheries Service. Site selection, design and construction oversight of an artificial reef for lobsters in Narragansett Bay, R.I.
1996, Ball Oyster Company. Evaluation of oyster grounds in Long Island Sound, Offshore, Conn.

1996, Beak Environmental Consultants. Sampling of fishery resources and aquaculture lease project in Rhode Island following the Cape North oil spill in Rhode Island waters.

1997-1998, University of Rhode Island. Aspects of bycatch in R.I. trawl fisheries. Supported by RIDEM for $18,000.

1997-1998, University of Rhode Island. Estimation of the tractive force applied by large whales to entangled fishing gear. Supported by NMFS for $6,500.

1997-1998, Beak Environmental Consultants. Assessment of the impacts of the North Cape Oil Spill on the surf clams off southern Rhode Island.

1998, National Marine Fisheries Service. Shellfish resource assessments in Dartmouth, Fairhaven, and New Bedford, Mass.

1998-1999, National Marine Fisheries Service. Development of an acoustic release system for lobster trap buoys.

1998-1999, Polaris Applied Sciences. Evaluation of the North Cape Oil Spill habitat restoration alternatives.

2000-2001, West of England. Implementation of North Cape Oil Spill Lobster Restoration Project - restocking 300,000 adult v-notched lobsters into Block Island Sound.

2000-2003, Point Judith Fishermen Co. -monitoring ocean disposal of fish waste, submission of reports to EPA.

2000-2001, Blue Crab Conservation Coalition – scientific advice on the status of blue crab stock in Chesapeake Bay and the future of the fishery.

2001, Bevans Oyster Co. Assessment of damage to oyster grounds in the Chesapeake Bay.

2001-2003, New Jersey D.E.P., Div. of Fish and Wildlife. Technical assistance with selection and training of stock assessment personnel.

2002-2003, Brayton Point Station (PG&E). Analyses of 30 year data set to assess the impact of the power plant on the fish distributions and abundance In Mount Hope Bay and Narragansett Bay.

2003, National Marine Fisheries Service, Evaluation of Factors Affecting the Performance of a Bottom Survey Trawl.

2002-2003, University of Rhode Island, Effects of Increasing Mesh Size on the Yield of the Northeast Groundfish Fisheries. Supported by the NMFS-SK Program for $128,500.

2003-2005, University of Rhode Island, Effects of Weather on the Performance of the NMFS Bottom Survey Trawl. Supported by the NMFS-CMER Program for $87,017.

2003-2005, City of New Bedford and NOAA NMFS, Assessment of Growth and Survival of Hard Clams Use in a Resource Stock Enhancement Project in Buzzards Bay, MA. 2003-2005, University of Rhode Island, Application of Acoustic Release Devices for Reducing Large Whale Entanglements. Supported by National Fish and Wildlife Foundation with a total budget of about $115,000.

2003-2005, University of Rhode Island, Effects of Weather on the Performance of the NMFS Bottom Survey Trawl. Supported by the NMFS-CMER Program for $87,017.

2004 Mid-Atlantic Fishery Management Council, Scup Stock Assessment.

2005-2007. University of Rhode Island. Small Scale Evaluation of Acoustic Pop-up Buoys in the Offshore Fixed Gear Fisheries. Supported by the National Fish and Wildlife Foundation for $124,000.

2005-2006. University of Rhode Island. Understanding and Documenting Cetacean Behavior in Trawl Nets. Supported by the NMFS/NOAA CMER Program. $87,000.

2005-2008. University of Rhode Island. Reducing Sea Turtle and Cetacean Bycatch in Trawls. Supported by the NMFS/NOAA CMER Program. $74,000+ $70,000+$14,000.

2006-2008 University of Rhode Island. Preliminary Assessment of Fish Utilization of the Waters adjacent to the Cape Cod National Seashore. Supported by National Park Service. $64,867.

2006-2008 University of Rhode Island. Reducing Cetacean and Sea Turtle Bycatch in Trawl Fisheries: Evaluating the Effectiveness of Bycatch Reduction Devices. Supported by the National Marine Fisheries Service. $86,000.

2004-2005 National Marine Fisheries Service. Evaluation of the effect of alternative leader designs for pound nets in lower Chesapeake Bay, Va. on sea turtle interactions and target catch retention.

2006. National Marine Fisheries Service. Evaluation of the potential for sea turtle entanglement in crab pot buoy lines and gillnets in lower Chesapeake Bay, Va.

2007. Food and Agriculture Organization (FAO) of the United Nations. Evaluate the effect of fishing on deepwater habitats.

2007. Harbour, Smith, Harris and Merritt, LLC. Assessment of the likelihood of *Vibrio vulnificus* being transmitted from oysters consumed in a Galveston restaurant.

2008. Weaver's Cove Energy, (subcontract through Applied Science Associates), Assessment of the potential impacts of an offshore Liquefied Natural Gas (LNG) terminal on the benthic resources of Mount Hope Bay, MA.

2008-2009. Scientific Certification Systems. Marine Stewardship Council certification of US East Coast red crab fishery.

2009 National Marine Fisheries Service. Evaluation of a modified Turtle Excluder Device (TED) in the scallop trawl fishery.

2009-2010 EXXON MOBILE, subcontract through Natural Resource Group, Evaluation of the distribution of fishing activity in the New York Bight Apex and the relationship with fish distributions and habitat characteristics, as related site selection for an offshore LGN terminal. 2009-2011 University of Rhode Island. Evaluation of a modified Turtle Excluder Device (TED) in the summer flounder trawl fishery. Supported by National Marine Fisheries Service, through the Southern New England Commercial Fishermen's Research Foundation, with a total project budget about $115,000, with about $48,000 to URI for the project design, data collection, and data analysis.

2009-2011 University of Rhode Island. Abundance, distribution and life history characteristics of mantis shrimp in Narragansett Bay, RI. Supported by RI DEM with a total budget of about $90,000.

2009-2010 US AID through a sub-contract to Academy of Educational Development, Development of a Curriculum for the Fisheries Training Program at URI.

2009. Pender and Coward LLC (attorneys for Virginia Department of Transportation). Evaluation of damages to oyster and clam aquaculture leases caused by bridge construction in Chincoteague VA.

2010 Friends of Goose Cove. Evaluation of the environmental impact of a proposed shellfish aquaculture farm on the ecology of Goose Cove, Maine.

2010 Friends of Blue Hill Bay. Evaluation of the environmental impact of a proposed salmon pen aquaculture farm on the ecology of Blue Hill Bay.

2010-2011 National Marine Fisheries Service. Evaluation of catch performance of a topless trawl in the summer flounder trawl fishery.

2010-2015 University of Rhode Island. Development of sustainable fisheries in Gambia, West Africa. Supported by USAID though URICRC, with the fisheries portion budget of about $115,000 annually.

2011-2016 University of Rhode Island. Development of sustainable fisheries in Senegal, West Africa.. Supported by USAID through URI CRC, with the fisheries portion budget of about $100,000 annually.

2011-2013 National Marine Fisheries Service. Technical Assistance with the evaluation of fishing gear performance

2010-2011 Global Trust. Pre-assessment of the sustainability of five fisheries in Louisiana with regard to Marine Stewardship Council principles.

2010-2011 Scientific Certification Systems. Marine Stewardship Council assessment of the Louisiana blue crab fishery for sustainability.

2011. Scientific Certification Systems. Marine Stewardship Council annual audits of Oregoan Dungeness crab fishery, and east coast deep sea red crab fishery.

2011-2012 World Bank. Stock assessments of the fishery resources of Cape Verde.

2012. Global Trust. Peer reviews of the MSC certification reports for snow crab fisheries of eastern Canada.

Principal Outreach Activity:

1987-1989 - University of Rhode Island, Fisheries and Aquaculture Extension. Supported by R.I. Sea Grant for approximately $40,000 annually and CRD match for $40,000 annually.

1989-1991 - University of Rhode Island, Fisheries and Aquaculture Extension. Supported by R.I. Sea Grant for approximately $65,000, CRD match for $30,000, and industry match for $15,000.

1990-1991 - University of Rhode Island, Fisheries and Aquaculture Extension. Supported by R.I. Sea Grant for $73,653, CRD match $30,000 and industry match $10,000.

1991-1992 - University of Rhode Island, Fisheries and Aquaculture Extension. Supported by R.I. Sea Grant for $59,903, CRD match $30,000 and industry match $15,000.

1992-1993 - University of Rhode Island, Fisheries and Aquaculture Extension. Supported by R.I. Sea Grant for $69,930, CRD match $30,000, and industry match $20,000.

1993-1994 - University of Rhode Island, Fisheries and Aquaculture Extension. Supported by R.I. Sea Grant for approximately $113,000, CRD match for $10,000, and industry match for $20,000.

1994-1995 - University of Rhode Island, Fisheries and Aquaculture Extension. Supported by R.I. Sea Grant for approximately $116,000, CRD match for $60,000, and industry match for $20,000.

1995-1998 - University of Rhode Island, Fisheries and Aquaculture Extension. Supported annually by R.I. Sea Grant for approximately $143,000, CRD match for $60,000 annually, and industry match for $20,000.

1995-1997 - University of Rhode Island, Outreach: the link between fisheries research and sustainable development of fishing resources. Supported by R.I. Sea Grant for $27,300, $22,100 and $12,891 and CRD match for $18,210, $11,700 and $6,850.

1995-1997. University of Rhode Island: Land-based summer flounder aquaculture: technical assistance to industry and a university demonstration project. Supported by R.I. Sea Grant for $58,370, $57,720+ and $33,670 and CRD match for $38,502, $38, 502, and $22,400.

1995-1997. University of Rhode Island. Development and Implementation of the Transient Gear, Shellfish Aquaculture Training Course. Supported by Cooperative Extension for $5,000 annually.

1996 and 1997. University of Rhode Island, Cooperative Extension. Fisheries and Aquaculture. About $50,000.

1997-1998. University of Rhode Island. Development and publication of "Guide to East Coast Marine Mammals and Sea Turtles." Supported by NMFS for $30,000 and RISG for $20,000.

1997-1998. University of Rhode Island. Technical assistance with implementation of large whale take-reduction plan in the Mid-Atlantic region. Supported by NMFS for $15,500.

1998 - NOAA. Development of a Training Manual in Fisheries Science and Technology for NOAA Corps officers.

1998-1999. University of Rhode Island, Fisheries and Aquaculture Extension. Supported by R.I. Sea Grant for $200,000, CRD match for approximately $80,000, and industry match for $20,000.

1998-1999 - University of Rhode Island. Technical assistance with the implementation of the harbor porpoise take-reduction plan in the Gulf of Maine and Mid-Atlantic. Supported by NMFS for $55,000.

1999-2000. University of Rhode Island, Fisheries and Aquaculture Extension. Supported by R.I. Sea Grant for $220,000, CELS match for approximately $80,000, and industry match for $20,000.

2000-2001 University of Rhode Island, Fisheries and Aquaculture Extension. Support of R.I. Sea Grant for $250,000, CELS match for approximately $80,000, and industry match for $20,000.

2001-2002 University of Rhode Island, Fisheries and Aquaculture Extension. Support of R.I. Sea Grant for $250,000, CELS match for approximately $80,000, and industry match for $20,000.

1999-2009 Atlantic States Marine Fisheries Commission. Preparation of 10 individual chapters for a fish stock assessment training manual (1999-2000), presentation of lectures at quarterly meetings for commission members (1999-2001); presentation of two one-week workshops annually for state fishery biologists on quantitative methods in fish stock assessment (20002009).

2005-2006 University of Rhode Island. Conduct workshops for fishermen on reducing cetacean and sea turtle interactions with trawl fishing gear in Southern New England. Supported by National Marine Fisheries Service for $35,000.

2010. National Marine Fisheries Service. Conduct a workshop on mitigating interactions between sea turtles and the bottom trawl fisheries in the Mid-Atlantic region.

Honorable Commissioner Keliher

Department of Marine Resources

21 State Street

Augusta ME 04333

RECEIVED
JUL 7 5 2018
Maine Department of Marine Resources

RE: Bar Harbor Oyster Co. Proposed Oyster Aquaculture site near Hancock County/Bar Harbor Airport.

Dear Commissioner Keliher,

The Aircraft Owners and Pilots Association (AOPA) is the world's largest aviation organization representing 350,000 pilots, aircraft owners, and aviation enthusiasts, of which over 1,500 are residents of the State of Maine. AOPA is committed to ensuring the safety, continued viability, and development of airports across the United States. We want to go on the record as objecting to the new application made by Bar Harbor Oyster Company to install aquaculture activity at the proposed location near the Hancock County/Bar Harbor Airport.

The Federal Aviation Administration (FAA) guidance for Hazardous Wildlife Attractants On or Near Airports, Advisory Circular 150/5200-33B recommends that there be no aquaculture within five miles of an airport and that anything less than two miles constitutes a significant threat to aircraft. As the proposed placement of both tracts would exist under the base leg of the traffic pattern into Runway 17 – 35 of the Hancock County (BHB) Airport, less than 1.2 nm from the runway threshold, we strongly object to the proposed Oyster farm as it presents a serious threat to lives of residents, pilots and passengers and constitutes a distinct compromise on aviation safety.

EXHIBIT
DMR
8
Comment Letters

In June of 2015, we objected to the permit issued by DMR (#BHBGC4) to Acadia Sea Farms is pursuant to US Army Corp of Engineers (ACOE) permit #NAE-2010-00282. However, the permit did provide caveats which incorporated certain special conditions resulting from coordination with the FAA, including:

1 Prior to installation of any structures, the permittee, shall conduct a study to determine a baseline estimate of the number of seabirds likely to be found within the projected area. Copies of this study shall be submitted to the appropriate personnel of the FAA New England Region Office.

2 The permittee shall contact the ACOE, Maine Project Office and appropriate FAA Office at least two weeks prior to the installation of associated structures.

3 The permittee shall conduct post-installation seabird monitoring studies utilizing the same methodology as was used for the pre-installation seabird monitoring study at the authorized project site for three years.

4 The permittee shall take all available and practicable steps to discourage the attraction of seabirds to the aquaculture facility.

5 If, based on review of the quarterly post-installation studies, the Corps, in consultation with the FAA, determines that congregating seabirds attracted to the aquaculture facility present an aviation safety risk, this permit may be modified, suspended, or revoked in accordance with 33.CFR 325.7.

While these conditions serve as an attempt by the ACOE to mitigate potential safety impacts resulting from the proposed Oyster Farm, we oppose any permitting of any aquaculture site within 2 nm of a public use airport to constitute *known risk*, pursuant to FAA AC 150/5200-33B. Furthermore, Condition #3 of the provisional approval stipulates that Acadia Sea Farms conduct post-installation seabird monitoring studies for a period of no less than three years prior to any additional installation approvals. Given that the FAA agreed to this study in light of a lack of data confirming oyster farms are not wildlife attractants, we *object to the approval* of any additional aquaculture sites within 2 nm of the airport until the

study is completed and results are thoroughly vetted through the FAA and made public.

Please consider AOPA a resource and an ally in all efforts to promote, preserve, and protect the unique economic engine and transportation asset that is the Hancock County (BHB) Airport. Our Government Affairs offices are available to assist at any time and may be reached at 202/737-7950.

Sincerely,

Dawn R. H. Veatch

AOPA Gov't Affairs

Senior Director, Airport and State Advocacy

Dawn Veatch
AOPA, Gov't Affairs
Senior Director, Airport and State Advocacy

+1.678.230.9429

Burke, Cindy L

From: Perry, John
Sent: Tuesday, June 30, 2015 4:12 PM
To: Burke, Cindy L; Robinson, Diantha
Subject: RE: Application of Bar Harbor Oyster Co., LLC for a standard lease

Categories: To Do

Hi Cindy,

Portion of this proposed facility appears to be within a mapped Tidal Waterfowl and Wading Bird Habitat. We recommend that the siting of the project not intersect with any mud flats.

Thank you,

John

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
284 State Street, 41 SHS
Augusta, Maine 04333-0041
Tel (207) 287-5254; Cell (207) 446-5145
Fax (207) 287-6395
www.mefishwildlife.com

Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.

From: Burke, Cindy L
Sent: Friday, June 05, 2015 3:46 PM
To: Perry, John; Libby, David A; DiBello, Carol; Kelly, John; Kanwit, Kohl; Sirois, Alison; Neal, LeeAnn NAE; Carroll, Jay; Burr, Gregory; bhhmaster@barharbormaine.gov
Subject: Application of Bar Harbor Oyster Co., LLC for a standard lease located east of Israel Point, west of Thomas Island, Mt. Desert Narrows, Thomas Bay, Bar Harbor

Attached are a Request for Review and Comment and an application for a standard lease as referenced above.

Please contact me if you have any questions.

Thank you.

Cindy L. Burke, Paralegal Assistant
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333
(207) 624-6567
cindy.l.burke@maine.gov

RECEIVED
JUL 15 2016
Maine Department of Marine Resources

COUNTY OF HANCOCK
Commissioners' Office
50 State Street, Suite 7
Ellsworth, Maine 04605

Commissioners:
Steven E. Joy, District I
Percy L. Brown Jr., District II
Antonio Blasi, District III

Scott A. Adkins
County Administrator

July 12, 2016

Maine Department of Marine Resources
ATTN: Aquaculture Hearing Officer
21 State House Station
Augusta, ME 04333-0021

RE: Bar Harbor Oyster Co.,LLC application for a 24.5 acre suspended aquaculture lease located 0.8 miles SSE of the Hancock County – Bar Harbor Airport

To whom it may concern,

We are writing to express our opposition to a proposed 24.5 acre suspended aquaculture lease to be located less than one mile SSE of the Hancock County – Bar Harbor Airport.

Floating aquaculture gear is a known attractant to a wide variety of birds, which are a wildlife hazard to aircraft. The proposed lease site is located directly underneath the traffic pattern for runway 35. It is important to note that aircraft flying in the traffic pattern for RYW 35 are descending through approximately 400 or 500' AGL (above ground level) while they over fly the area where the lease is being proposed on approach to runway 35. The FAA recommends a distance of five (5) statute miles between the farthest edge of the airport's AOA and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace. Please see figure 1.

In the interest of public safety, aviation safety, property protection, and in accordance with FAA Advisory Circular 150/5200-33B, the Hancock County Commissioners and the Hancock County – Bar Harbor Airport are opposed to the project referenced above.

If the Department of Marine Resources chooses to issue a lease regardless of the objection from the County of Hancock, then at the very least, the County is requesting that the applicant be required to:
1. Install anti-perching devices on both the tops and the undersides of the floating OysterGro cages in order to reduce the attractiveness of the site to birds.
2. Remove, Collect and Dispose of all significant amounts of bio-fouling material (i.e. more than a layer of slime) from the OysterGro cages and discard it off-site at a land-based compost facility.

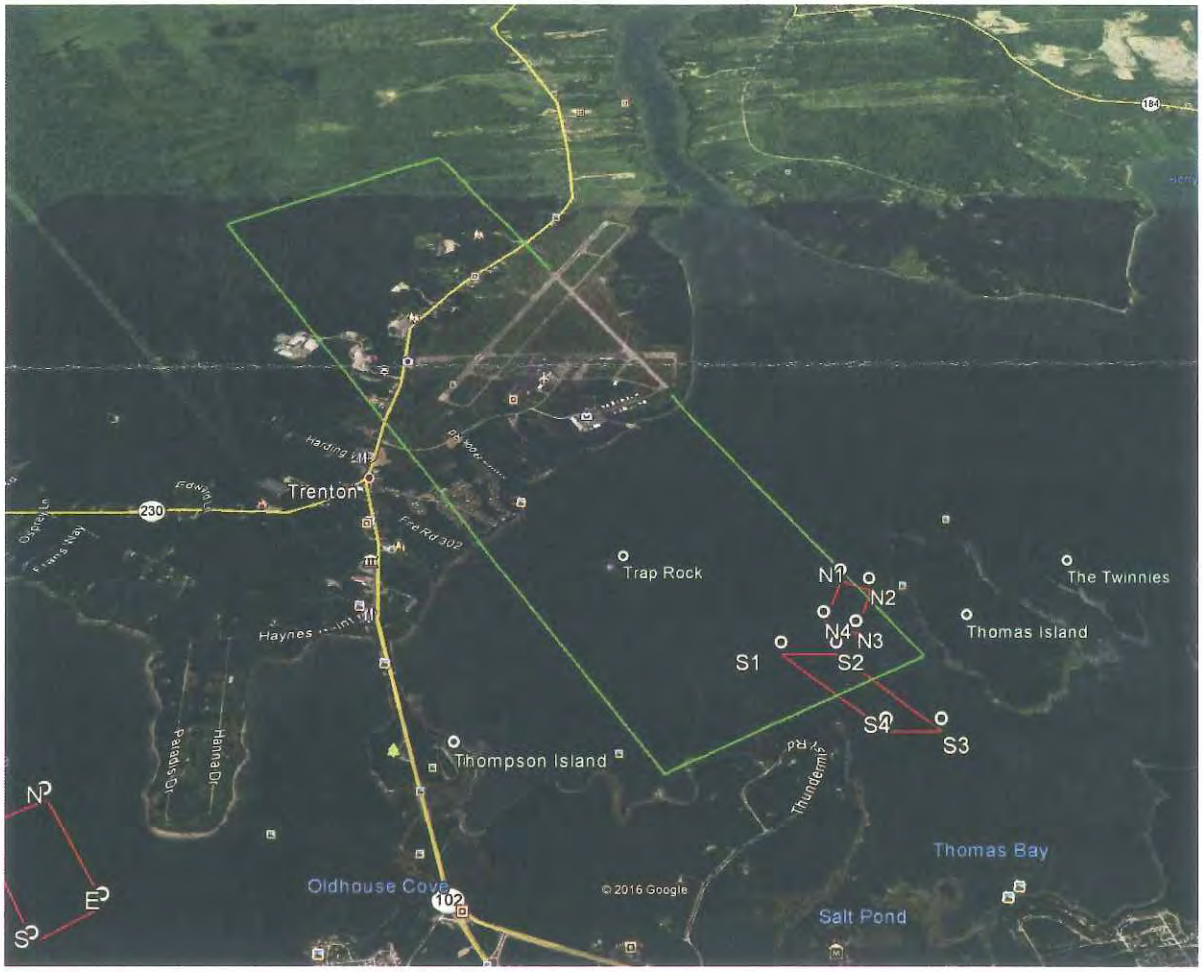
Sincerely,

Steven E. Joy
County Commissioner

Percy L. Brown
County Commissioner

Antonio Blasi
County Commissioner

Figure 1



Note: The **green** line represents the traffic pattern for Runway 35. The red lines show the location of the proposed lease site between Israel point and Thomas Island.

Office: (207) 667-9542 www.co.hancock.me.us Fax: (207) 667-1412
E-mail: hancock.county@co.hancock.me.us

Burke, Cindy L

From: Ryan Swanson ~ Pemetic Purveyors with RE/MAX Hills & Harbors <ryanswanson@remax.net>
Sent: Friday, July 15, 2016 4:01 PM
To: Dean, Hannah; Burke, Cindy L
Subject: Public Comment for aquaculture lease located east of Israel Point and west of Thomas Island, Mt. Desert Narrows, Bar Harbor, Maine

Categories: To Do

Dear Ms. Dean & Ms. Burke,

Please include my comments in your file for the application submitted by Bar Harbor Oyster Co., LLC for an aquaculture lease located east of Israel Point and west of Thomas Island, Mt. Desert Narrows, Bar Harbor, Maine.

I strongly oppose any aquaculture lease granting that is located within the FAA recommended safety distance guidelines for airport operations. The above aquaculture lease application you recently received is well within the safety distance guidelines that FAA recommends **should not** have existing aquaculture production. Bird strike is a real & dangerous threat to safety and without doubt will increase in potential risk with every aquaculture lease that is granted near an airport. A single corporation profiting at the risk of death or injury to self and property for anyone flying into/out of Bar Harbor - Hancock County Airport (BHB), or even just being under the flight path, is unacceptable.

Beyond the obvious, common sense reasoning that risk of death or injury by airplane bird strike makes the granting of aquaculture leases near an airport a seemingly easy decision to deny, there is an immense economical risk that comes with the granting of aquaculture leases near BHB: when a plane goes down or lands with issue because of bird strike, this news will spread fast and ridership at BHB will plummet. This is not something that our local economy needs, again and specifically, solely for the profit of a single corporation.

Additionally, the proposed aquaculture lease will have gear in view from many points within Acadia National Park. Establishing a precedent that it is OK to place industrial marine factories (in essence what these aquaculture operations are) at the foot of and in view from one of the most treasured National Parks in our country, makes no sense at all. I sincerely hope that DMR and other lease granting powers that be will not be blinded by potential for short term gain and by effect, mar what has taken a century and counting to preserve and protect.

When a bird strike event happens, which is inevitable ~ only a matter of time once aquaculture leases within the airport safety zone commence, the public record will reflect countless citizens, organizations, town & county officials and educated professionals advising DMR to realize this danger and deny certain aquaculture lease applications because of it. Please keep this in mind. Aquaculture has a bright & promising future as a viable sector of Maine's overall economy, but only if conducted in a thoughtful and sustainable manner.

Thank you kindly for your consideration and inclusion of my remarks in the public comment record for this lease application.

Sincerely,

Ryan Swanson

Ryan Swanson, Broker
Certified Luxury Home Marketing Specialist
Accredited Home Staging Specialist
GREEN, Designee
Certified Residential Specialist
Graduate of the REALTOR Institute
Accredited Buyer Representative

Pemetic Purveyors ~ Finer Real Estate Services
RE/MAX Hills & Harbors Realty
409 High Street, Suite B
Ellsworth, ME 04605
Phone (office & cellular): 207.667.SELL
Email: RyanSwanson@remax.net

TOWN OF TRENTON

RECEIVED
JUL 18 2016
Maine Department of Marine Resources

July 13, 2016

Maine Department of Marine Resources
ATTN: Aquaculture Hearing Officer
21 State House Station
Augusta, ME 04333-0021

RE: Application of Bar Harbor Oyster Co., LLC

Dear Aquaculture Hearing Officer:

On behalf of the Trenton Board of Selectmen, I wish to register our unanimous opposition to the grant of an aquaculture lease at the site specified, "east of Israel Point and west of Thomas Island, Mt. Desert Narrows."

Our basis for this opposition is our firm belief that placing this enterprise at that location will jeopardize the safety and property of Trenton residents. This location is within five miles of the Hancock County Bar Harbor Airport, and per FAA Advisory Circular 150/5200-33B, can be expected to increase risk to flights arriving and departing the airport due to bird strikes. OysterGro cages are known bird attractants.

Recent history has shown, with an oyster aquaculture lease already granted in nearby Goose Cove, that human lives and airport safety are not top priorities when balanced against profit and a mission to make aquaculture a viable Maine industry. By its own admission, DMR does not assume to pass judgement for FAA on air safety. However, DMR may choose to use common sense and not blind itself to the increased risk within close proximity of the airport. If this new lease is issued, Hancock County Bar Harbor Airport will be nearly surrounded with significant aquaculture leases, having the potential to attract enough birds into the flight paths that safe flight becomes a serious gamble. We strongly oppose this aquaculture lease.

59 Oak Point Road, Trenton, Maine 04605 ▪ (207) 667-7207
E-mail: townoffice@trentonme.com ▪ Web: www.trentonme.com

We ask that a representative of the Trenton Board of Selectmen be permitted to speak at the public hearing in Bar Harbor on July 28th.

Sincerely,

Fred Ehrlenbach, Chairman
Trenton Board of Selectmen

Cc: County of Hancock
Commissioners' Office
50 State Street, Suite 7
Ellsworth, ME 04605

Department of the Army
US Army Corps of Engineers
ATTN: COL Christopher A. Barron
District Engineer
696 Virginia Road
Concord, MA 01742-2751

Town of Bar Harbor
ATTN: Cornell F. Knight
Town Manager
93 Cottage Street
Bar Harbor, ME 04609

TOWN OF TRENTON

RECEIVED
JUL 18 2016
Maine Department of Marine Resources

July 13, 2016

Department of the Army
US Army Corps of Engineers
ATTN: COL Christopher A. Barron
District Engineer
696 Virginia Road
Concord, MA 01742-2751

RE: Oyster Aquaculture Application, Israel Point & Thomas Island, Mt. Desert Narrows, Bar Harbor, ME

Dear COL Barron:

On July 28th, the Maine State Department of Marine Resources (DMR) will hold a public hearing on the application of the Bar Harbor Oyster Co., LLC, to place a 24.5-acre oyster aquaculture lease at the above noted location. This is within a five-mile radius of the Hancock County Bar Harbor Airport, and per Federal Aviation Administration (FAA) Advisory Circular 150/5200-33B is therefore considered to be a risk to flights arriving and departing due to the increased attraction of hazardous wildlife, particularly birds. Experience has shown that DMR will almost certainly seek clarification from FAA of this risk to air traffic through the US Army Corps of Engineers.

This airport is in the Town of Trenton, and the Trenton Board of Selectmen has unanimously decided to oppose this aquaculture effort based on our concerns for the safety of our residents and their property. Knowing that your agency will be included in the approval process, we request that US Army Corps of Engineers hold a public hearing on this application so that the concerns of the public may be aired and heard by all.

Thank you for your consideration and your time. We will be monitoring the progress of this application, and look forward to hearing from you when DMR turns to your agency, as we expect it will.

59 Oak Point Road, Trenton, Maine 04605 ▪ (207) 667-7207
E-mail: townoffice@trentonme.com ▪ Web: www.trentonme.com

Sincerely,

Fred Ehrlenbach, Chairman
Trenton Board of Selectmen

Cc: County of Hancock
Commissioners' Office
50 State Street, Suite 7
Ellsworth, ME 04605

Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Town of Bar Harbor
ATTN: Cornell F. Knight
Town Manager
93 Cottage Street
Bar Harbor, ME 04609

RECEIVED
JUL 21 2016
Maine Department of
Marine Resources

July 18, 2016

Maine Dept. of Marine Resources
ATTN: Aquaculture Hearing Officer
21 State House Station
Augusta, Maine
04333-0021

Dear Officer,

Although we support most Aquaculture projects, there is a right way and a wrong way to do these projects. With regard to the proposed Goose Cove and Israel Point oyster farm projects near MDI., we are opposed. While in this area of Maine it may not be possible to seed oysters into a sandy bed as they naturally occur (the method used in the highly successful Duxbury Massachusetts oyster farms for example), but oyster cages can be submerged below the water surface making them nearly invisible, and eliminating what would otherwise become an industrial oyster farm despoiling the incredible views of the area. We hope that the Army Corps of Engineers will consider everyone effected by your decisions. It is possible for the aquaculture industry to coexist along with the tourist industry, and the interests of property owners in the area. Let's protect the beauty of Mount Desert Island for everyone to enjoy for generations to come.

Sincerely,

Donna Pinto

Donna and Steve Pinto

Burke, Cindy L

From: Michael Grunze <grunze@me.com>
Sent: Saturday, July 23, 2016 5:46 PM
To: Dean, Hannah; Burke, Cindy L
Subject: RE: Bar Harbor Oyster Co.,LLC application for a 24.5 acre suspended aquaculture lease located 0.8 miles SSE of the Hancock County – Bar Harbor Airport

Dear Aquaculture Hearing Officers,
I am writing to express my opposition against the proposed 24.5 acre suspended aquaculture lease to be located less than one mile SSE of the Hancock County – Bar Harbor Airport. The reasons I am heavily against this aquaculture lease are the same why I am opposing the lease in Goose Cove: public safety and endangerment of lives and property of the residents of Trenton and passing through visitors. It is well established and recorded that floating aquaculture gear is a known attractant to a wide variety of birds, which are a wildlife hazard to aircraft. The proposed lease site is located directly underneath the traffic pattern for runway 35, so that the real danger exists that a landing or starting airplane will experience a bird strike with unforeseen consequences for the control of the airplane You should have noticed that the Trenton School is in the the traffic pattern for Runway 35. This means that all residents having children in the Trenton school could be confronted with a terrible accident.
I point out again-as in my letters written to you and newspapers when referring to the lease in Goose Cove- the abundance of various sea birds in the area flying in an altitude landing planes are seen at, and again the still unresolved liability situation if a accident happens.
I can not understand why aquaculture leases have to be located in the traffic patterns of an airport, when there is plenty nearby space for aquacultures. Not only in my opinion it is irresponsible and ignorant of public safety to grant a lease under an approach path for airplanes, considering the risks for human life and property.
Sincerely,

Michael Grunze

Dr. Michael Grunze
P.O. Box 977
Mount Desert, ME 04660-0977
USA
Phone: (207) 479 3567
e-mail: grunze@me.com

Burke, Cindy L

From:	William Stockman <wsstockman@aol.com>
Sent:	Saturday, July 23, 2016 12:33 PM
To:	Dean, Hannah; Burke, Cindy L
Subject:	Public Comment re Bar Harbor Oyster Co.,LLC aquaculture lease
Attachments:	Deterring Coastal Birds from roosting.pdf; Opposition Letter to DMR (WSS).pdf

RE: Suspended Oyster aquaculture lease application by Bar Harbor Oyster Co., LLC for a 24.5 acre lease located in Mt. Desert Narrows between Israel Point and Thomas Island, Bar Harbor, Maine

July 23, 2016

Dear Aquaculture Hearing Officer and Ms. Dean & Ms. Burke,

I am writing to express my strong opposition to granting such a lease. My objection is based on well documented evidence that the type of floating gear (Oyster Gro) being proposed to be used at this site, and the methodology of flipping them to "desiccate sea growth", is known to attract sea birds.

Supporting this evidence, the DMR's own Site Review (#2015-10) conducted on 9/25/2015 shows on page 3, a picture (Image 1) of 3 cormorants, one on each of the 3 floating cages in a string, at the experimental site. The report summarizes this fact on page 16, and also reports on a small flock of gulls. Extrapolating this documented finding then, is it possible that when the lease site is fully operational with 1240 floating cages, there will be, among other birds, 1200+ cormorants below the flight path?

Two significant problems result from such attraction:

First, the oysters suspended within the cages are exposed to significant and concentrated amounts of bird fecal matter, leading to their potential contamination. In a You Tube video that I took on 9/27/2015 at the experimental site in Mt Desert Narrows https://youtu.be/FKY93V7F8TI, not only were there cormorants perching on the floating cages as per above, again in a near 1 for 1 ratio, there was clear evidence of numerous fecal matter deposits on the floats and cages below and water immediately surrounding them. Also attached to this letter, is a thorough, well documented Canadian study which has innumerable references to seabirds being attracted to such floating cages, particularly when they are flipped, and also confirming the fecal contamination problems that are known to result.

Second, and of even greater concern, is the fact that by attracting birds to the lease area, which is directly under a flight path to Bar Harbor Regional Airport, and within 10,000 of same, the proposed operation will create an unnecessary air traffic safety risk, to the flying public and those who work, travel and live in proximity to the airport.

While the DMR has taken the position that it has no responsibility for Air Safety, by allowing a known bird attractant to be placed within proximity to this airport as is proposed, the DMR will be complicit in exacerbating risks to the public at large, without having weighed the adequacy of preventive methods to avert such risks, including specific details of the equipment used and the exact operational practices employed, which the DMR does have explicit responsibility for. In addition, unless some alternative public process is established, through which the air safety aspects of this application are evaluated with equal thoroughness and openness as the DMR applies to overseeing its "mandated criteria", this matter of grave public concern to Maine residents and visitors, will possibly again be dealt with "behind closed doors" by the two Federal Agencies responsible for the Air Safety aspects of this lease.

In summary, I urge you to deny approval of the proposed lease. I also request that the DMR advocate for the establishment of a **publicly open process** by the US Army Corps of Engineers and FAA to deal with permitting the use of suspended aquaculture at this location.

Sincerely,

William S. Stockman
580 Oak Point Rd.
Trenton, Maine, 04605

2 attachments

EXHIBIT B

Aquacultural Engineering 40 (2009) 87–94

Contents lists available at ScienceDirect

Aquacultural Engineering

journal homepage: www.elsevier.com/locate/aqua-online

Deterring coastal birds from roosting on oyster culture gear in eastern New Brunswick, Canada

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[a] Fisheries and Oceans Canada, Gulf Fisheries Centre, P.O. Box 5030, Moncton, New Brunswick, Canada E1C 9B6
[b] Institut de Recherche sur les Zones Côtières, 232B rue de l'Église, Shippagan, New Brunswick, Canada E8S 1J2
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ARTICLE INFO

Article history:
Received 20 August 2008
Accepted 17 November 2008

Keywords:
Crassostrea virginica
Oyster
Aquaculture
Phalacrocorax auritus
Cormorant
Roosting
Birds

ABSTRACT

An ornithological survey was conducted along the eastern coastline of New Brunswick, Canada, where oysters are cultivated in suspension using PVC bags and wire-mesh cages. Thirteen bird species and a variety of unidentified shorebirds were observed roosting on the floating oyster gear. The double-crested cormorant (*Phalacrocorax auritus*) was the most common species observed (47.6% of all counts), closely followed by herring gulls (*Larus argentatus*) and common terns (*Sterna hirundo*) at 18.7% and 13.0%, respectively. Birds were densely aggregated where few cages or bags had been deployed. A gear-type effect was also detected: birds were more abundant on floating cages (mean = 47.9/100 m^2 of exposed area, S.E. = 5.8) than on floating bags (mean = 32.8/100 m^2, S.E. = 1.9). The survey was followed by two experiments designed to test the effects of gear modifications on bird abundance and diversity. For bags, results indicated that shallow immersion (~6 cm below surface) and floater instability were effective deterrents to *P. auritus*, reducing its abundance by a 37-fold factor. For wire-mesh cages, a dented triangular structure mounted on top of floaters was a harassing physical barrier to roosting behaviour, consequently reducing bird abundances to null (or near null) values.

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1. Introduction

Communal roosting is a common behaviour in several species of social animals, including coastal birds (McGowan et al., 2006). This behaviour has evolved independently numerous times (Beauchamp, 1999; McGowan et al., 2006) and is thought to positively impact several species of seabirds (Roycroft et al., 2007) by enhancing the sharing of information (Ward and Zahavi, 1973; Ydenberg and Prins, 1984; Dall, 2002) and by promoting recruitment (Richner and Heeb, 1996; Dall, 2002). Roosting behaviour can also increase foraging efficiency, reduce predation risk and minimize thermoregulatory costs (Ydenberg and Prins, 1984; Beauchamp, 1999; McGowan et al., 2006). The behaviour has been studied extensively from an ecological perspective, providing a better understanding of roost choices (Luís et al., 2001; Rogers, 2003; Rogers et al., 2006), species distribution (King, 1996; Bugoni and Vooren, 2005; Dittman et al., 2005) and hierarchical dominance in roosting populations.

From an aquaculture perspective, however, communal roosting is considered a nuisance. Birds predate on cultured fish stocks (Jenkins and Smith, 1998; Dorr et al., 2004; King, 2005), and their presence also raises other concerns, such as water contamination by faecal coliforms (Kirschner et al., 2004; Kuntz et al., 2004; Bucio et al., 2006), propagation of pathogenic agents (Flowers et al., 2004; Overstreet and Curran, 2004; Mitchell et al., 2005), and organic enrichment of sediments (Powell et al., 1991). Several bird-deterring techniques have been suggested in the literature (see review by Mott and Boyd, 1995). These methods include scaring effigies (Stickley et al., 1995; Seamans, 2004), repelling chemicals (Cotterill et al., 2004; McWilliam and Cheke, 2004; Harpaz and Clark, 2006), fencing and netting (Mott and Flynt, 1995; Nemtzov and Olsvig-Whittaker, 2003), harassment devices (Mott et al., 1998; Tobin et al., 2002), and the more-drastic solution of hunting (Bechard and Marquez-Reyes, 2003; McWilliam and Cheke, 2004).

In New Brunswick, Canada, oyster (*Crassostrea virginica*) farming is carried out in approximately 15 embayments (Fig. 1). Suspended culture, in which oysters are held inside floating PVC bags or floating cages (Fig. 2), is the predominant farming technique. In winter floaters are removed to lower stocks onto the bottom where they are protected from the thick ice. At other times, however, stocks are suspended at the surface in a relatively

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doi:10.1016/j.aquaeng.2008.11.003

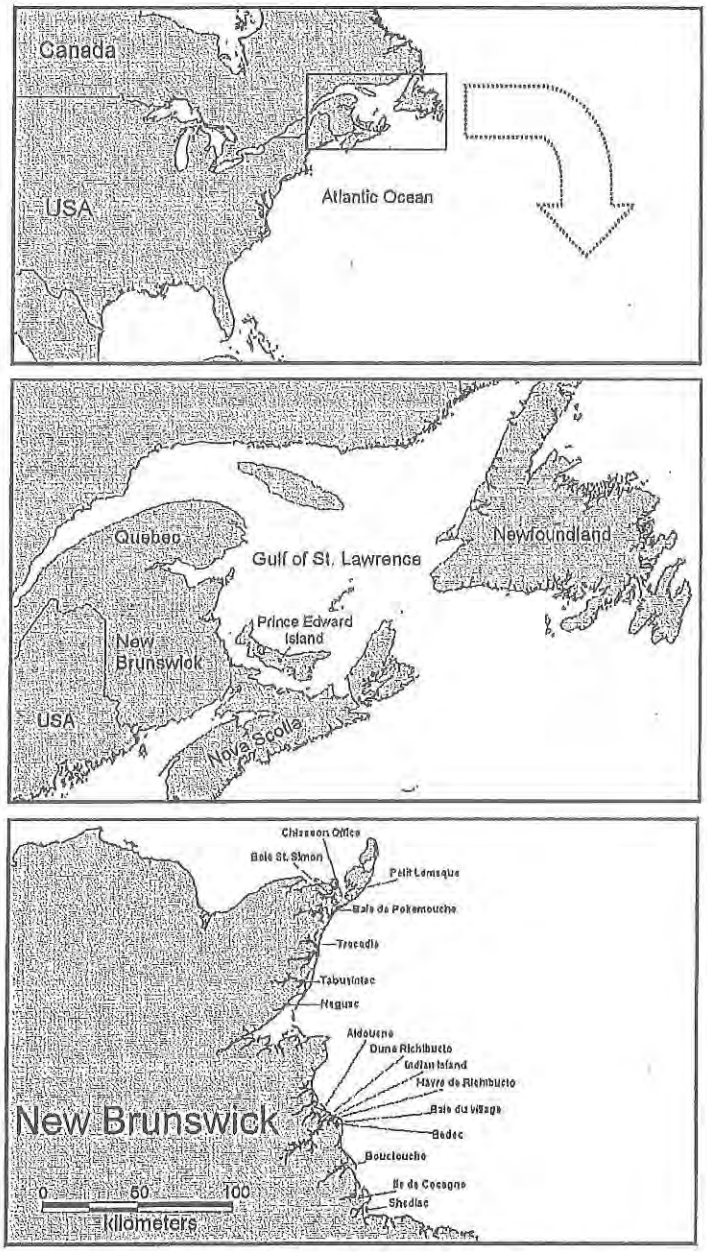

Fig. 1. Map of study area showing oyster farming sites in New Brunswick.

warm and phytoplankton-abundant environment, thereby enhancing shell growth and shortening the production cycle. When at the surface, stocks are easily accessible to growers for harvesting and grading procedures; moreover, the suspended bags or cages can be flipped and temporarily exposed to air, thereby desiccating biofoulers. The entire technique for suspending and flipping bags and cages has been developed in New Brunswick in the late 1990s.

Floating gear, on the other hand, provides substantial roosting areas for coastal birds. In 2004, Canadian food safety and fisheries agencies have requested that all oysters contained in floating bags or cages be depurated prior to harvest. The precautionary depuration procedure requires the transfer of suspended stocks onto the bottom 30 days prior to harvest (14 days if stocks are subsequently tested for coliforms as required by the Canadian Shellfish Sanitation Program, 2005). The new regulation increases both labour and time needed to complete the production cycle. Consequently, there is a growing interest in developing new floating gear designs that could prevent birds from roosting in oyster farms. The underlying rational is that effective bird-deterring designs would ultimately be exempted from the regulation pertaining to depuration.

In this paper, we begin by reporting results from an ornithological survey conducted in NB oyster farms. We identify bird species and report on their abundance in relation to current

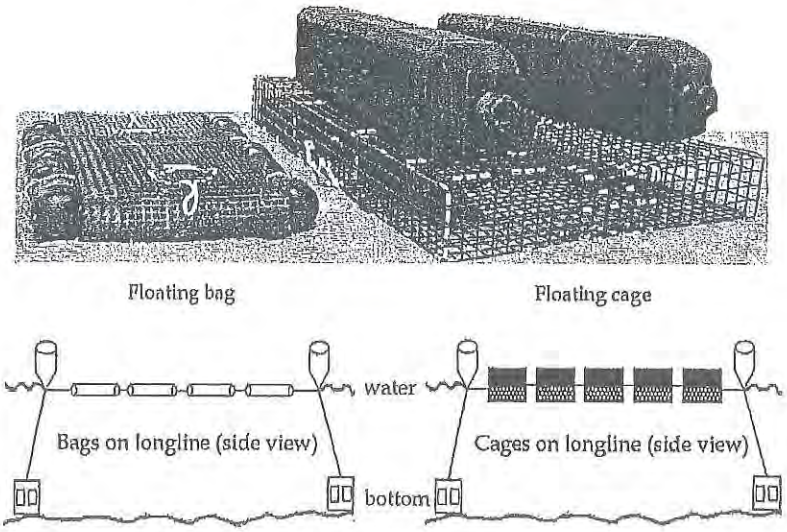

Fig. 2. Floating gear types currently present in New Brunswick oyster farms. The trademark for the floating cage is OysterGro®, manufactured by Bouctouche Bay Industries Ltd. in New Brunswick.

floating gear designs. The survey was followed by two field experiments examining the effects of gear modifications on bird abundance and diversity.

2. Methods

2.1. Survey

In September and October 2005, 15 embayments along the eastern coastline of New Brunswick were visited. The location of each embayment is identified in Fig. 1. A total of 22,600 floating bags and 4609 floating cages were examined for the presence of birds. Bird observations were carried out either from land or from a kayak using binoculars and a spotting scope. Only birds perching on oyster gear and any associated buoys were identified and counted. Bird counts reflect the maximum number of individuals seen at any one time during a disturbance-free period of 15 min. All counts were carried out between 10 a.m. and 4 p.m. A subsequent analysis indicated that the time of day had no significant effect on bird counts.

It is also important to note that the surface areas available for roosting differ according to gear type. For a floating bag, which has two small floaters and one PVC bag that are exposed and available for roosting, this area is approximately 0.35 m^2. For a floating cage, the available roosting area provided by the two large floaters is 0.45 m^2; the wire-mesh cage itself is too deep—12 cm below surface—to provide a roosting surface. In keeping with this information, counts were standardized as the number of birds per 100 m^2 of available (exposed) roosting area.

2.2. Floating bag experiment

In 2006, three different types of floating bags were deployed within an experimental setting. The first type consisted of standard bags (S) with lateral floaters typical of those in current use by most growers (Fig. 3a). For the second type, the S configuration was modified by positioning the two side floaters onto the top of the bag, thereby allowing the bag to sink approximately 3 cm below the water surface (Fig. 3b). While the two floaters remain a potential perching platform for birds, the area they offer to birds is less than 20% that of the unmodified bag. This modification was termed M1. In a second modification (M2), the S configuration was modified by positioning the two side floaters on top of the bag, but the bag itself was lowered approximately 6 cm below the surface using loose rope (Fig. 3c). The loose rope between the floaters and the bag rendered the floaters unstable.

The experimental bags were deployed in three embayments: Chiasson Office, Néguac, and Richibucto (see Fig. 1). At each of these sites, three longlines were deployed equidistantly (6.1 m) as illustrated in Fig. 4. Each longline held 11 floating bags per type (S, M1 and M2), which were dispersed in groups of three bags (except at the end of the longline where space was lacking and where grouping was limited to two bags). Details regarding bag layout are of no consequence since the entire longline itself was considered the statistical unit. For that reason, a single bird count (per bag type) was performed for each experimental longline. Bird counts represent the maximum number of individuals seen at any one time during a 1-h period. Counts were standardized to the number of birds per 100 bags. Species richness represents the number of different species observed during the count period. All observations were carried out at bi-monthly intervals between August 28 and November 7, 2006.

Data were partitioned into five 2-week intervals. Factors for each variable were analysed using a complete randomized block design with repeated measures according to gear type (fixed between-subjects factor with three levels [M1, M2 and S]), sites (fixed between-subjects factor with three levels [Chiasson Office, Néguac, and Richibucto]), sampling time (random factor with five levels of repeated measurements) and all their mutual interactions. Mauchly's test ($\alpha = 0.05$) was used to assess whether datasets conformed to the sphericity assumption required for a repeated measure analysis. When the sphericity assumption was not met, the degrees of freedom were adjusted accordingly using the Huynh–Feldt correction. Significant differences between all possible combinations of sample means for gear type were also assessed using Tukey's HSD test ($\alpha = 0.05$). All analyses were performed with SPSS 10.0 for Windows® (SPSS Inc., Chicago, IL, USA).

2.3. Floating cage experiment

Bouctouche Bay Industries Ltd. has developed the AntiCormo (AC), a bird-deterrent structure that can be fitted easily onto

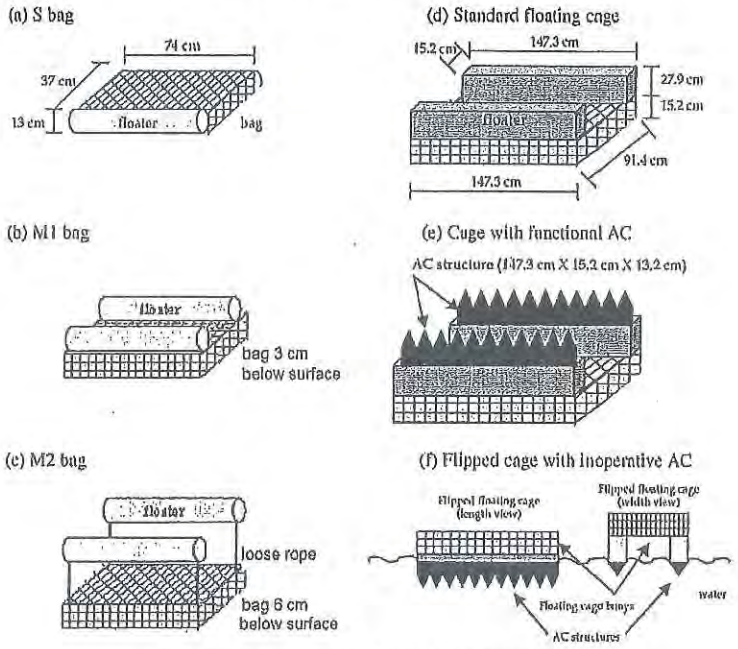

Fig. 3. Floating gear prototypes tested in the present study.

floating cages as illustrated in Fig. 3e. Taking into account the ability of birds to adapt over time, our goal in this experiment was to assess the effectiveness of the AC in deterring birds over an extended period. Our experimental approach was based on the full conversion of two farms and monitoring of bird abundance over an 18-week period (July 1 to November 3, 2007). One farm was located in Shediac Bay and contained a total of 140 floating cages (14 longlines of 10 cages); the second farm was located in Bouctouche Bay and held 100 cages (10 longlines of 10 cages). The two farms were selected because they were isolated, with the closest commercial aquaculture activities located at a distance of 5–10 km. The presence of bird colonies near the experimental farms was verified using two approaches: (1) by removing the AC devices at the start and completion of the experiment, and (2) by occasionally flipping cages and rendering the AC non-functional (i.e., underwater, as illustrated in Fig. 3f).

Once a week, bird counts were performed from land using a spotting scope. Counts were limited to four randomly selected longlines (the statistical unit). The count period consisted of four consecutive 15-min intervals. Data corresponding to the interval with the maximum number of individuals of the same species were kept for analysis. Descriptive statistics, including the standardized bird abundance per 100 floating cages, were computed for each experimental site.

3. Results

3.1. Survey

Thirteen bird species and a variety of unidentified shorebirds were observed roosting on floating oyster gear (Table 1). The most common species was the double-crested cormorant (*Phalacrocorax auritus*), representing almost half (47.6%) of all counts. Behaviourally, *P. auritus* was observed perching and preening, as well as drying its wings. Herring gulls (*Larus argentatus*) and common terns (*Sterna hirundo*) were also often spotted (18.7% and 13.0% of all counts).

Bird abundance was inversely correlated with the total roosting area made available by the floating gear (Fig. 5). The highest abundances, indicating a high degree of aggregation, were recorded at sites containing relatively few bags or cages. In keeping with these results, bird abundances were normalized to remove the effect of available roosting area. Following this correction, we found that birds were more abundant on floating

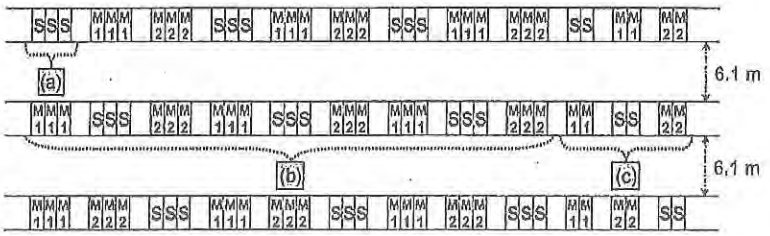

Fig. 4. Example layout of three experimental longlines holding three types of floating oyster bags: standard (S), first modification (M1) and second modification (M2). (a) Group of three bags of the same gear type, (b) Nine groups of three bags laid out in a random order. (c) End of experimental culture line with three groups of two bags laid out in a random order.

Table 1
Bird species surveyed at commercial oyster farming sites in New Brunswick.

Common name	Latin name	Total counts	% Total count
Double-crested cormorant	*Phalacrocorax auritus*	1588	47.6
Herring gull	*Larus argentatus*	624	18.7
Common tern	*Sterna hirundo*	435	13.0
Black-bellied plover	*Pluvialis squatarola*	160	4.8
Dunlin	*Calidris alpina*	146	4.4
Greater black-backed gull	*Larus marinus*	117	3.5
Immature gull	*Larus* spp.	70	2.1
Bonaparte's gull	*Larus philadelphia*	52	1.6
Ringed-billed gull	*Larus delawarensis*	51	1.5
Shorebirds spp.	*Calidris* spp.	28	0.8
Red-breasted merganser	*Mergus serrator*	23	0.7
Black duck	*Anas rubripes*	9	0.3
Greater yellowlegs	*Tringa melanoleuca*	8	0.2
Great blue heron	*Ardea herodias*	6	0.2
Lesser yellowlegs	*Tringa flavipes*	1	0.0
All species		3318	100.0

cages (mean = 47.9/100 m^2, S.E. = 5.8) than on floating bags (mean = 32.8/100 m^2, S.E. = 1.9) ($P < 0.001$, Mann–Whitney).

3.2. Floating bag experiment

Table 2 summarizes the outcome of the floating bag experiment. Gear type, which is the key factor of interest in the present investigation, was the only factor that yielded a significant effect on species richness in the main effects category. Moreover, gear type showed no interactions with sampling time, indicating that the effect on species richness was consistent through time. Similar effects were detected on bird abundance. Gear type exerted a significant influence on abundance and there was no interaction between gear type and sampling time. The same outcome was obtained whether all species were grouped or *P. auritus* was analysed separately. By contrast, no gear effect was found when analysing other species (e.g., *Larus* spp.) separately.

Fig. 6 shows mean species richness (panel A) and abundance (panel B) in relation to gear type. Post hoc analyses (Tukey's HSD) indicated that gear-type effects were attributable to differences between S and M2 bags. On average, species richness for S bags was approximately seven times higher than for M2 bags. A total of nine species were seen roosting on S bags throughout the duration of the experiment compared to only two species for M2 bags (*P. auritus* and *Larus marinus*). S bags also attracted a greater number of *P. auritus* compared to M2 bags. Average standardized abundance of *P. auritus* was approximately 37 times greater on S bags than on M2 bags.

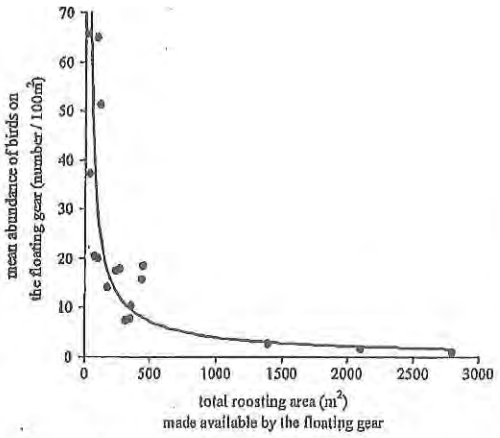

Fig. 5. Relationship between bird abundance and the roosting area made available by floating oyster gear. The solid line is a power-fit to the following function: $y = 1388.5x^{-0.8467}$ ($r^2 = 0.82$, $P < 0.001$). Data points represent the mean values of several sampling dates for individual sites.

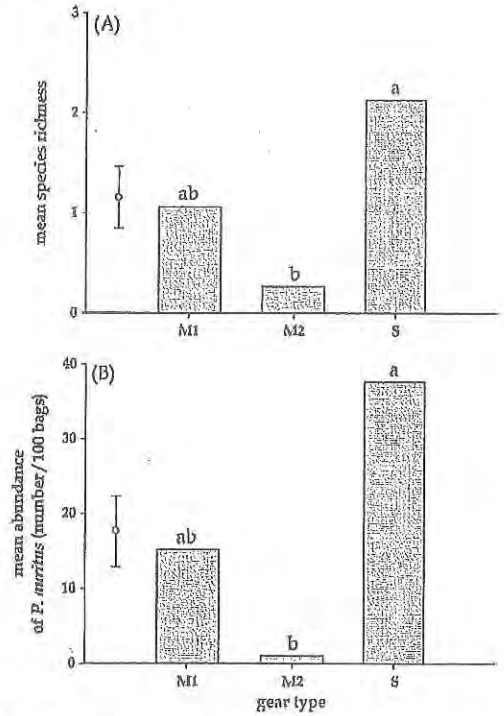

Fig. 6. Mean species richness (a) and abundance (b) of birds roosting on floating bags of type S (standard), M1 (first modification) and M2 (second modification). Means are presented with a single error bar provided by the standard model error (SME). Bars with different letters differ significantly from each other (Tukey's HSD).

3.3. Floating cage experiment

Fig. 7 shows the abundance time-series for the two experimental sites. At the Shediac site, AC structures were absent on several occasions (weeks 1–4, 15, 17 and 18); during these periods, abundance varied between 100 and nearly 500 birds per 100 floating cages. Abundance was also elevated at times when AC devices were inoperative due to the flipping of cages. Similar results were obtained at the Bouctouche site, with the exception that no birds were spotted in week 4 when the AC structures were absent. A total of 2195 individuals and 5 species (*P. auritus*, *L. argentatus*, *L. marinus*, *S. hirundo* and *Ardea herodias*) were identified at the two experimental sites; *P. auritus* was the dominant species, accounting for nearly 85% of all counts; *S. hirundo* and *L. argentatus* were also regularly spotted, with each species accounting for approximately 7% of all counts. Together these observations indicate that the two experimental sites were appropriate for testing the AC device.

Floating cages equipped with functioning AC devices attracted fewer birds. Weekly abundance estimates varied between 0 and 1.25 (S.E. = 0.72) birds per 100 floating cages at the Shediac site. During a 13-week period, only two individual birds, one *P. auritus* and one *L. argentatus*, were seen at this site. A total of 146 birds were spotted at the Bouctouche site, and weekly abundance

Table 2
Summary of a complete randomized block with repeated measures carried out on four variables: species richness, abundance of all species, abundance of *P. auritus*, and abundance of *Larus* spp.

Source of variation	d.f.	SS	Adjusted d.f.[a]	MS[b]	F	P[c]
(a) Species richness						
Site (S)	2	5.91	–	2.96	2.08	0.241
Gear type (G)	1	26.31	–	13.16	9.25	0.032
Between-subjects error	4	5.69	–	1.42	–	–
Time of sampling (T)	4	1.47	–	0.37	0.82	0.534
T × G	8	0.80	–	0.10	0.22	0.981
T × S	8	6.53	–	0.82	1.82	0.148
Within-subjects error	16	7.20	–	0.45	–	–
Total	44	53.91	–	–	–	–
(b) Abundance all species						
Site (S)	2	6019.38	–	3009.69	4.38	0.098
Gear type (G)	2	14181.00	–	7090.50	10.32	0.026
Between-subjects error	4	2745.84	–	686.46	–	–
Time of sampling (T)	4	4018.77	–	1004.69	5.33	0.006
T × G	8	2549.94	–	318.74	1.69	0.176
T × S	8	4730.53	–	591.31	3.13	0.025
Within-subjects error	16	3014.79	–	188.42	–	–
Total	44	37260.25	–	–	–	–
(c) Abundance of *P. auritus*						
Site (S)	2	4150.17	–	2075.08	4.00	0.111
Gear type (G)	2	10280.67	–	5140.33	9.91	0.028
Between-subjects error	4	2074.46	–	518.61	–	–
Time of sampling (T)	4	4878.04	3.24	1503.75	3.35	0.050
T × G	8	4317.36	6.49	665.46	1.48	0.257
T × S	8	8493.23	6.49	1309.10	2.92	0.048
Within-subjects error	16	5817.84	12.98	448.37	–	–
Total	44	40011.77	–	–	–	–
(d) Abundance of *Larus* spp.						
Site (S)	2	880.13	–	440.07	1.39	0.348
Gear type (G)	2	1846.76	–	923.38	2.92	0.165
Between-subjects error	4	1264.04	–	316.01	–	–
Time of sampling (T)	4	71.36	3.37	21.17	0.58	0.654
T × G	8	76.06	6.74	11.28	0.31	0.933
T × S	8	255.65	6.74	37.92	1.05	0.444
Within-subjects error	16	489.10	13.48	36.28	–	–
Total	44	4883.10	–	–	–	–

[a] Adjusted degrees of freedom (Huynh–Feldt correction) where the sphericity assumption is not met, $\alpha = 0.05$.
[b] Computed with adjusted degrees of freedom where available.
[c] Bold font indicates significance, $\alpha = 0.05$.

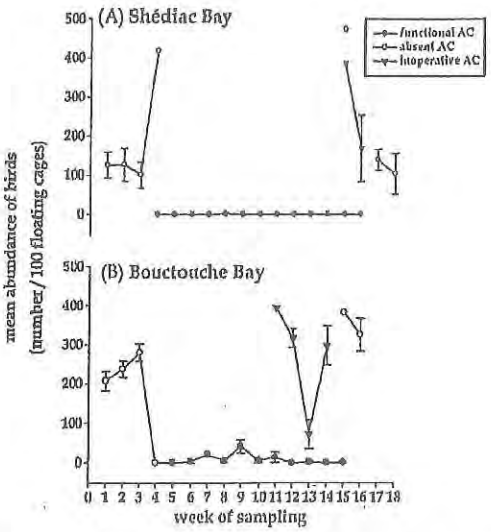

Fig. 7. Mean abundance (±S.E.) of birds roosting on experimental cages in Shediac (A) and Bouctouche (B). The time-series extends from July 1, 2007 (week 1) to November 3, 2007 (week 18).

estimates ranged from 0 to 41.9 (S.E. = 15.9) birds per 100 floating cages. There were no indications that birds progressively adapted (i.e., no increase in abundance over time) to AC devices at either site.

4. Discussion

4.1. Survey

An extensive ornithological survey indicated the presence of 13 bird species roosting on floating oyster gear along the eastern coastline of New Brunswick. Three species—*P. auritus*, *L. argentatus* and *S. hirundo*—which together were responsible for 79% of all counts, clearly dominated. These species have well-established breeding areas along the eastern coastline of New Brunswick (Erskine, 1992). They prey mainly on fish and small marine invertebrates such as zooplankton. There are previous reports on bird interference with aquaculture operations, although these studies have focused exclusively on predation of cultured stocks, such as *P. auritus* preying on farm-raised channel catfish (*Ictalurus punctatus*) in the southern United States (King, 1996). In our study, it was apparent that birds used floating oyster gear as roosting platforms.

Regarding abundances, the survey indicated that birds were densely aggregated where few culture units had been deployed (as per the relationship presented in Fig. 5). This result implies that the

bird nuisance perception is function of the farming activity level. For example, in New Brunswick, the number of floating bags within individual leases varies from approximately 100 to 12,481 units (Comeau et al., 2006). We estimate, based upon the relationship shown in Fig. 5, that the lower end of activity (100 bags) could attract approximately 24 birds over a small body of water (~700 m^2), whereas the peak activity level (12,481 bags) may attract 49 birds dispersed over a much larger body of water (150,000 m^2). In keeping with this comparison, the amount of floating gear within a culture lease is perhaps a key parameter to consider when modelling the potential risks of water contamination by birds.

Another factor that seems relevant is gear type. Our survey suggests that birds have a preference for floating cages. This result may be attributable to cage design: compared to floating bags, floating cages are relatively stable and offer a large roosting area, attributes that are compatible with the large size and gregarious nature of *P. auritus* (Hatch and Weseloh, 1999). Also, floating cages provide an elevated platform (~17 cm above the waterline) compared to floating bags (~2 cm above the waterline). After diving, *P. auritus* usually looks for an elevated spot to perch, where it can spread its wings to dry its feathers (Hatch and Weseloh, 1999).

4.2. Floating bag experiment

The goal of this experiment was to compare bird diversity and abundance in relation to three bag deployment strategies: (1) standard (S) deployment, with the top portion of bags floating above surface; (2) modified (M1) deployment, with bags completely submerged ~3 cm under the surface; and (3) modified (M2) deployment, with bags submerged ~6 cm under the surface. Significant differences in bird diversity were found only between S and M2 bags; of the nine species observed on S bags during the experiment, only two (*P. auritus* and *L. marinus*) were seen on M2 bags. Three factors likely contributed to the decrease in diversity on M2 bags: depth (6 cm) at which the bag itself was maintained, floater instability, and interactions with floating organic debris. In terms of bag depth, it is noteworthy that both *P. auritus* and *L. marinus* have long tarsi, averaging approximately 8 and 9 cm, respectively (The New Brunswick Museum); species that avoided M2 have comparatively short tarsi. An influence of depth is consistent with reports of coastal birds changing their roost location with rising tides (e.g., Luis et al., 2001; Rogers, 2003; Rosa et al., 2006). The M2 modification also increased floater instability. Our field notes indicate that the roosting time was very short (seconds) when *P. auritus* and *L. marinus* successfully landed on the M2 floaters; it was also noted that other species attempted to roost on M2 floaters but failed and immediately flew away. Lastly, S and M2 bags interacted differently with floating debris. S bags were often covered with common eelgrass (*Zostera marina*), which can be uprooted following storm events; M2 bags were generally free of this marine plant. This observation appears relevant because *S. hirundo* was occasionally seen feeding on small invertebrates entangled within *Z. marina*.

With respect to abundance, the total counts on S bags were dominated by *P. auritus* and *Larus* spp. The experiment showed that M2 bags attracted significantly fewer *P. auritus*. The reason(s) for M2 selecting against *P. auritus* cannot be determined with certainty. As indicated above, it is known that *P. auritus* has a marked preference for elevated perches where it can spread its wings to dry its feathers (Hatch and Weseloh, 1999). Floater instability and the depth of M2 bags probably prevented this behaviour. Gulls, on the other hand, do not exhibit this behaviour, which may explain why none of the experimental bag types significantly reduced the abundance of *Larus* spp.

4.2.1. Floating cages experiment

In this experiment, the effectiveness of a bird-deterrent device, the AntiCormo developed by Bouctouche Bay Industries Ltd., was evaluated at two sites over an 18-week period. The AC can be fitted onto existing floating cages as shown in Fig. 3e. In the absence of the AC device, floating cages generally attracted several birds as was expected from earlier survey results. This outcome indicates that local breeding populations, essential for the testing of the AC device, were present at the two experimental sites.

The AC device considerably reduced the number of birds roosting on floating cages at both experimental sites, with mean abundance falling from several hundred birds per 100 cages to null (or near null) values. Field notes indicate that the highest abundances at the Bouctouche site (e.g., mean of 41.9 birds/100 cages, week 9) were mainly associated with improperly installed AC devices. There were no indications that the birds adapted to properly installed AC devices. Therefore it appears that the AC was a harassing physical barrier, comparable to metal spikes or prongs commonly mounted, for example, on top of navigation buoys, park lights and gutters.

It is noteworthy that floating cages are occasionally flipped to control biofoulers as part of normal husbandry procedures. Once flipped, AC structures are submerged and the entire wire-mesh cage is exposed to air, thereby desiccating biofoulers. In our study, birds quickly resumed their roosting activities at times when cages were flipped. In New Brunswick, growers flip cages three to five times per year, and the desiccation of biofoulers normally occurs over 48 h, after which cages are returned to their normal position and the AC devices resume their full functionality. Evidently, cage flipping should be avoided some time prior to oyster harvesting. The "no-flip" period could be as short as 14 days in cases where there is follow-up testing for coliforms (Canadian Shellfish Sanitation Program, 2005).

5. Conclusion

This report presented possible mitigation measures to prevent the roosting of birds in oyster farms along the eastern coastline of New Brunswick. For floating bags, results suggested that floater instability coupled with an immersion depth of approximately 6 cm (for the bag itself) were effective deterrents to birds. Depth and floater instability were achieved simply by attaching loose ropes between floaters and bags. However, we recognize that this deployment scheme may not represent a practical option for the industry, given that bags must occasionally be flipped and exposed to air in order to control (desiccate) fouling organisms. Hence it is unlikely that the bag prototypes tested in the present investigation will be adopted by the industry. To date, no practical design has been found for floating bags, although the reported information on bird behaviour in the present report is useful for ongoing research.

For floating cages, a dented triangular structure (AC) mounted on top of each floater was an effective deterrent to birds. Moreover, from a practical perspective, the AC does not interfere with normal husbandry procedures. New floaters, commercially produced by Bouctouche Bay Industries Ltd. (New Brunswick, Canada), incorporate the AC (USA Patent No. D578,424 and Canadian Registration No. 125146).

Acknowledgements

Ève-Julie Arsenault, Tina Rousselle, and Roland Chiasson patiently identified and counted the birds; Alyre Chiasson, Rhéal Savoie, Marie-Josée Maillet, Marcel Léger, Christian Norris, Abel Noel, Sylvio Doiron, and Bettie Arsenault assisted in developing the project; Joe Caissie, Paul Savoie, Martin Mallet, and Serge Leblanc kindly provided access to the study sites. This study was funded by

the Professional Shellfish Growers Association of New Brunswick in partnership with the Department of Fisheries and Oceans of Canada (Aquaculture Collaboration Research and Development Program, project MG-06-04-003) and the New Brunswick Department of Agriculture and Aquaculture.

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Table 1
Bird species surveyed at commercial oyster farming sites in New Brunswick.

Common name	Latin name	Total counts	% Total count
Double-crested cormorant	*Phalacrocorax auritus*	1588	47.6
Herring gull	*Larus argentatus*	624	18.7
Common tern	*Sterna hirundo*	435	13.0
Black-bellied plover	*Pluvialis squatarola*	160	4.8
Dunlin	*Calidris alpina*	146	4.4
Greater black-backed gull	*Larus marinus*	117	3.5
Immature gull	*Larus* spp.	70	2.1
Bonaparte's gull	*Larus philadelphia*	52	1.6
Ringed-billed gull	*Larus delawarensis*	51	1.5
Shorebirds spp.	*Calidris* spp.	28	0.8
Red-breasted merganser	*Mergus serrator*	23	0.7
Black duck	*Anas rubripes*	9	0.3
Greater yellowlegs	*Tringa melanoleuca*	8	0.2
Great blue heron	*Ardea herodias*	6	0.2
Lesser yellowlegs	*Tringa flavipes*	1	0.0
All species		3318	100.0

cages (mean = 47.9/100 m^2, S.E. = 5.8) than on floating bags (mean = 32.8/100 m^2, S.E. = 1.9) ($P < 0.001$, Mann–Whitney).

3.2. Floating bag experiment

Table 2 summarizes the outcome of the floating bag experiment. Gear type, which is the key factor of interest in the present investigation, was the only factor that yielded a significant effect on species richness in the main effects category. Moreover, gear type showed no interactions with sampling time, indicating that the effect on species richness was consistent through time. Similar effects were detected on bird abundance. Gear type exerted a significant influence on abundance and there was no interaction between gear type and sampling time. The same outcome was obtained whether all species were grouped or *P. auritus* was analysed separately. By contrast, no gear effect was found when analysing other species (e.g., *Larus* spp.) separately.

Fig. 6 shows mean species richness (panel A) and abundance (panel B) in relation to gear type. Post hoc analyses (Tukey's HSD) indicated that gear-type effects were attributable to differences between S and M2 bags. On average, species richness for S bags was approximately seven times higher than for M2 bags. A total of nine species were seen roosting on S bags throughout the duration of the experiment compared to only two species for M2 bags (*P. auritus* and *Larus marinus*). S bags also attracted a greater number of *P. auritus* compared to M2 bags. Average standardized abundance of *P. auritus* was approximately 37 times greater on S bags than on M2 bags.

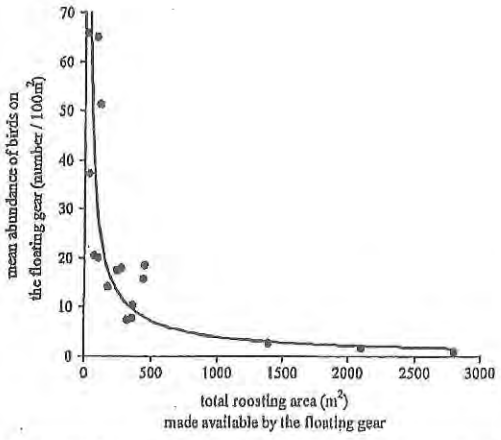

Fig. 5. Relationship between bird abundance and the roosting area made available by floating oyster gear. The solid line is a power-fit to the following function: $y = 1388.5x^{-0.8487}$ ($r^2 = 0.82$, $P < 0.001$). Data points represent the mean values of several sampling dates for individual sites.

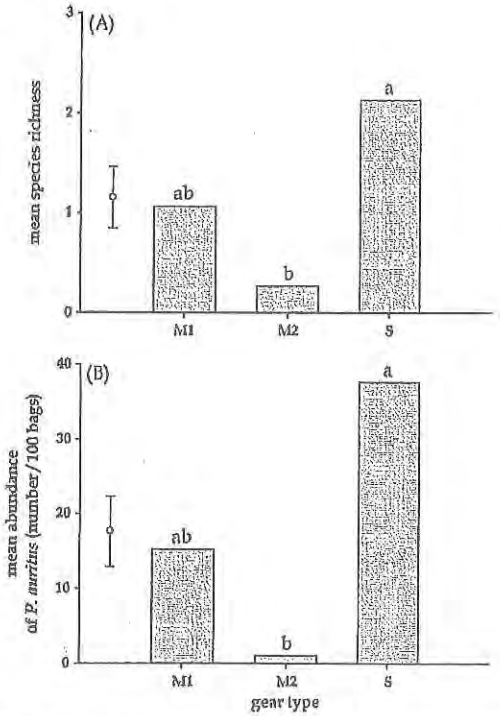

Fig. 6. Mean species richness (a) and abundance (b) of birds roosting on floating bags of type S (standard), M1 (first modification) and M2 (second modification). Means are presented with a single error bar provided by the standard model error (SME). Bars with different letters differ significantly from each other (Tukey's HSD).

3.3. Floating cage experiment

Fig. 7 shows the abundance time-series for the two experimental sites. At the Shediac site, AC structures were absent on several occasions (weeks 1–4, 15, 17 and 18); during these periods, abundance varied between 100 and nearly 500 birds per 100 floating cages. Abundance was also elevated at times when AC devices were inoperative due to the flipping of cages. Similar results were obtained at the Bouctouche site, with the exception that no birds were spotted in week 4 when the AC structures were absent. A total of 2195 individuals and 5 species (*P. auritus*, *L. argentatus*, *L. marinus*, *S. hirundo* and *Ardea herodias*) were identified at the two experimental sites; *P. auritus* was the dominant species, accounting for nearly 85% of all counts; *S. hirundo* and *L. argentatus* were also regularly spotted, with each species accounting for approximately 7% of all counts. Together these observations indicate that the two experimental sites were appropriate for testing the AC device.

Floating cages equipped with functioning AC devices attracted fewer birds. Weekly abundance estimates varied between 0 and 1.25 (S.E. = 0.72) birds per 100 floating cages at the Shediac site. During a 13-week period, only two individual birds, one *P. auritus* and one *L. argentatus*, were seen at this site. A total of 146 birds were spotted at the Bouctouche site, and weekly abundance

Table 2
Summary of a complete randomized block with repeated measures carried out on four variables: species richness, abundance of all species, abundance of *P. auritus*, and abundance of *Larus* spp.

Source of variation	d.f.	SS	Adjusted d.f.[a]	MS[b]	F	P[c]
(a) Species richness						
Site (S)	2	5.91	–	2.96	2.08	0.241
Gear type (G)	1	26.31	–	13.16	9.25	0.032
Between-subjects error	4	5.69	–	1.42	–	–
Time of sampling (T)	4	1.47	–	0.37	0.82	0.534
T × G	8	0.80	–	0.10	0.22	0.981
T × S	8	6.53	–	0.82	1.82	0.148
Within-subjects error	16	7.20	–	0.45	–	–
Total	44	53.91	–	–	–	–
(b) Abundance all species						
Site (S)	2	6019.38	–	3009.69	4.38	0.098
Gear type (G)	2	14181.00	–	7090.50	10.32	0.026
Between-subjects error	4	2745.84	–	686.46	–	–
Time of sampling (T)	4	4018.77	–	1004.69	5.33	0.006
T × G	8	2549.94	–	318.74	1.69	0.176
T × S	8	4730.53	–	591.31	3.13	0.025
Within-subjects error	16	3014.79	–	188.42	–	–
Total	44	37260.25	–	–	–	–
(c) Abundance of *P. auritus*						
Site (S)	2	4150.17	–	2075.08	4.00	0.111
Gear type (G)	2	10280.67	–	5140.33	9.91	0.028
Between-subjects error	4	2074.46	–	518.61	–	–
Time of sampling (T)	4	4878.04	3.24	1503.75	3.35	0.050
T × G	8	4317.36	6.49	665.46	1.48	0.257
T × S	8	8493.23	6.49	1309.10	2.92	0.048
Within-subjects error	16	5817.84	12.98	448.37	–	–
Total	44	40011.77	–	–	–	–
(d) Abundance of *Larus* spp.						
Site (S)	2	880.13	–	440.07	1.39	0.348
Gear type (G)	2	1846.76	–	923.38	2.92	0.165
Between-subjects error	4	1264.04	–	316.01	–	–
Time of sampling (T)	4	71.36	3.37	21.17	0.58	0.654
T × G	8	76.06	6.74	11.28	0.31	0.933
T × S	8	255.65	6.74	37.92	1.05	0.444
Within-subjects error	16	489.10	13.48	36.28	–	–
Total	44	4883.10	–	–	–	–

[a] Adjusted degrees of freedom (Huynh–Feldt correction) where the sphericity assumption is not met, $\alpha = 0.05$.
[b] Computed with adjusted degrees of freedom where available.
[c] Bold font indicates significance, $\alpha = 0.05$.

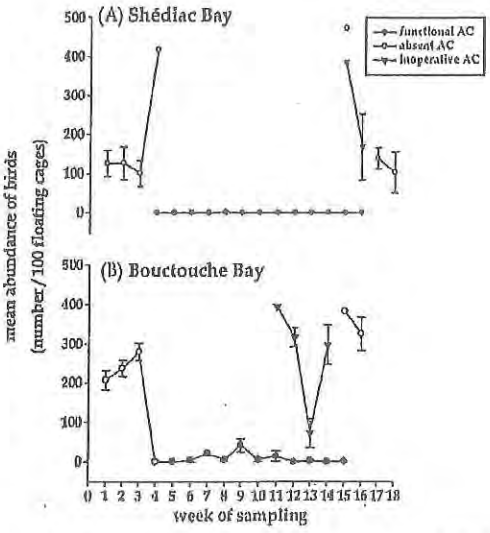

Fig. 7. Mean abundance (±S.E.) of birds roosting on experimental cages in Shediac (A) and Bouctouche (B). The time-series extends from July 1, 2007 (week 1) to November 3, 2007 (week 18).

estimates ranged from 0 to 41.9 (S.E. = 15.9) birds per 100 floating cages. There were no indications that birds progressively adapted (i.e., no increase in abundance over time) to AC devices at either site.

4. Discussion

4.1. Survey

An extensive ornithological survey indicated the presence of 13 bird species roosting on floating oyster gear along the eastern coastline of New Brunswick. Three species—*P. auritus*, *L. argentatus* and *S. hirundo*—which together were responsible for 79% of all counts, clearly dominated. These species have well-established breeding areas along the eastern coastline of New Brunswick (Erskine, 1992). They prey mainly on fish and small marine invertebrates such as zooplankton. There are previous reports on bird interference with aquaculture operations, although these studies have focused exclusively on predation of cultured stocks, such as *P. auritus* preying on farm-raised channel catfish (*Ictalurus punctatus*) in the southern United States (King, 1996). In our study, it was apparent that birds used floating oyster gear as roosting platforms.

Regarding abundances, the survey indicated that birds were densely aggregated where few culture units had been deployed (as per the relationship presented in Fig. 5). This result implies that the

bird nuisance perception is function of the farming activity level. For example, in New Brunswick, the number of floating bags within individual leases varies from approximately 100 to 12,481 units (Comeau et al., 2006). We estimate, based upon the relationship shown in Fig. 5, that the lower end of activity (100 bags) could attract approximately 24 birds over a small body of water (~700 m^2), whereas the peak activity level (12,481 bags) may attract 49 birds dispersed over a much larger body of water (150,000 m^2). In keeping with this comparison, the amount of floating gear within a culture lease is perhaps a key parameter to consider when modelling the potential risks of water contamination by birds.

Another factor that seems relevant is gear type. Our survey suggests that birds have a preference for floating cages. This result may be attributable to cage design: compared to floating bags, floating cages are relatively stable and offer a large roosting area, attributes that are compatible with the large size and gregarious nature of *P. auritus* (Hatch and Weseloh, 1999). Also, floating cages provide an elevated platform (~17 cm above the waterline) compared to floating bags (~2 cm above the waterline). After diving, *P. auritus* usually looks for an elevated spot to perch, where it can spread its wings to dry its feathers (Hatch and Weseloh, 1999).

4.2. Floating bag experiment

The goal of this experiment was to compare bird diversity and abundance in relation to three bag deployment strategies: (1) standard (S) deployment, with the top portion of bags floating above surface; (2) modified (M1) deployment, with bags completely submerged ~3 cm under the surface; and (3) modified (M2) deployment, with bags submerged ~6 cm under the surface. Significant differences in bird diversity were found only between S and M2 bags; of the nine species observed on S bags during the experiment, only two (*P. auritus* and *L. marinus*) were seen on M2 bags. Three factors likely contributed to the decrease in diversity on M2 bags: depth (6 cm) at which the bag itself was maintained, floater instability, and interactions with floating organic debris. In terms of bag depth, it is noteworthy that both *P. auritus* and *L. marinus* have long tarsi, averaging approximately 8 and 9 cm, respectively (The New Brunswick Museum); species that avoided M2 have comparatively short tarsi. An influence of depth is consistent with reports of coastal birds changing their roost location with rising tides (e.g., Luîs et al., 2001; Rogers, 2003; Rosa et al., 2006). The M2 modification also increased floater instability. Our field notes indicate that the roosting time was very short (seconds) when *P. auritus* and *L. marinus* successfully landed on the M2 floaters; it was also noted that other species attempted to roost on M2 floaters but failed and immediately flew away. Lastly, S and M2 bags interacted differently with floating debris. S bags were often covered with common eelgrass (*Zostera marina*), which can be uprooted following storm events; M2 bags were generally free of this marine plant. This observation appears relevant because *S. hirundo* was occasionally seen feeding on small invertebrates entangled within *Z. marina*.

With respect to abundance, the total counts on S bags were dominated by *P. auritus* and *Larus* spp. The experiment showed that M2 bags attracted significantly fewer *P. auritus*. The reason(s) for M2 selecting against *P. auritus* cannot be determined with certainty. As indicated above, it is known that *P. auritus* has a marked preference for elevated perches where it can spread its wings to dry its feathers (Hatch and Weseloh, 1999). Floater instability and the depth of M2 bags probably prevented this behaviour. Gulls, on the other hand, do not exhibit this behaviour, which may explain why none of the experimental bag types significantly reduced the abundance of *Larus* spp.

4.2.1. Floating cages experiment

In this experiment, the effectiveness of a bird-deterrent device, the AntiCormo developed by Bouctouche Bay Industries Ltd., was evaluated at two sites over an 18-week period. The AC can be fitted onto existing floating cages as shown in Fig. 3e. In the absence of the AC device, floating cages generally attracted several birds as was expected from earlier survey results. This outcome indicates that local breeding populations, essential for the testing of the AC device, were present at the two experimental sites.

The AC device considerably reduced the number of birds roosting on floating cages at both experimental sites, with mean abundance falling from several hundred birds per 100 cages to null (or near null) values. Field notes indicate that the highest abundances at the Bouctouche site (e.g., mean of 41.9 birds/100 cages, week 9) were mainly associated with improperly installed AC devices. There were no indications that the birds adapted to properly installed AC devices. Therefore it appears that the AC was a harassing physical barrier, comparable to metal spikes or prongs commonly mounted, for example, on top of navigation buoys, park lights and gutters.

It is noteworthy that floating cages are occasionally flipped to control biofoulers as part of normal husbandry procedures. Once flipped, AC structures are submerged and the entire wire-mesh cage is exposed to air, thereby desiccating biofoulers. In our study, birds quickly resumed their roosting activities at times when cages were flipped. In New Brunswick, growers flip cages three to five times per year, and the desiccation of biofoulers normally occurs over 48 h, after which cages are returned to their normal position and the AC devices resume their full functionality. Evidently, cage flipping should be avoided some time prior to oyster harvesting. The "no-flip" period could be as short as 14 days in cases where there is follow-up testing for coliforms (Canadian Shellfish Sanitation Program, 2005).

5. Conclusion

This report presented possible mitigation measures to prevent the roosting of birds in oyster farms along the eastern coastline of New Brunswick. For floating bags, results suggested that floater instability coupled with an immersion depth of approximately 6 cm (for the bag itself) were effective deterrents to birds. Depth and floater instability were achieved simply by attaching loose ropes between floaters and bags. However, we recognize that this deployment scheme may not represent a practical option for the industry, given that bags must occasionally be flipped and exposed to air in order to control (desiccate) fouling organisms. Hence it is unlikely that the bag prototypes tested in the present investigation will be adopted by the industry. To date, no practical design has been found for floating bags, although the reported information on bird behaviour in the present report is useful for ongoing research.

For floating cages, a dented triangular structure (AC) mounted on top of each floater was an effective deterrent to birds. Moreover, from a practical perspective, the AC does not interfere with normal husbandry procedures. New floaters, commercially produced by Bouctouche Bay Industries Ltd. (New Brunswick, Canada), incorporate the AC (USA Patent No. D578,424 and Canadian Registration No. 125146).

Acknowledgements

Ève-Julie Arsenault, Tina Rousselle, and Roland Chiasson patiently identified and counted the birds; Alyre Chiasson, Rhéal Savoie, Marie-Josée Maillet, Marcel Léger, Christian Norris, Abel Noel, Sylvio Doiron, and Bettie Arsenault assisted in developing the project; Joe Caissie, Paul Savoie, Martin Mallet, and Serge Leblanc kindly provided access to the study sites. This study was funded by

the Professional Shellfish Growers Association of New Brunswick in partnership with the Department of Fisheries and Oceans of Canada (Aquaculture Collaboration Research and Development Program, project MG-06-04-003) and the New Brunswick Department of Agriculture and Aquaculture.

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RE: Suspended Oyster aquaculture lease application by Bar Harbor Oyster Co., LLC for a 24.5 acre lease located in Mt. Desert Narrows between Israel Point and Thomas Island, Bar Harbor, Maine

July 23, 2016

Dear Aquaculture Hearing Officer and Ms. Dean & Ms. Burke,

I am writing to express my strong opposition to granting such a lease. My objection is based on well documented evidence that the type of floating gear (Oyster Gro) being proposed to be used at this site, and the methodology of flipping them to "desiccate sea growth", is known to attract sea birds.

Supporting this evidence, the DMR's own Site Review (#2015-10) conducted on 9/25/2015 shows on page 3, a picture (Image 1) of 3 cormorants, one on each of the 3 floating cages in a string, at the experimental site. The report summarizes this fact on page 16, and also reports on a small flock of gulls. Extrapolating this documented finding then, is it possible that when the lease site is fully operational with 1240 floating cages, there will be, among other birds, 1200+ cormorants below the flight path?

Two significant problems result from such attraction:

First, the oysters suspended within the cages are exposed to significant and concentrated amounts of bird fecal matter, leading to their potential contamination. In a You Tube video that we took on 9/27/2015 at the experimental site in Mt Desert Narrows https://youtu.be/FKY93V7F8TI, not only were there cormorants perching on the floating cages as per above, again in a near 1 for 1 ratio, there was clear evidence of numerous fecal matter deposits on the floats and cages below and water immediately surrounding them. Also attached to this letter, is a thorough, well documented Canadian study which has innumerable references to seabirds being attracted to such floating cages, particularly when they are flipped, and also confirming the fecal contamination problems that are known to result.

Second, and of even greater concern, is the fact that by attracting birds to the lease area, which is directly under a flight path to Bar Harbor Regional Airport, and within 10,000 of same, the proposed operation will create an unnecessary air traffic safety risk, to the flying public and those who work, travel and live in proximity to the airport.

While the DMR has taken the position that it has no responsibility for Air Safety, by allowing a known bird attractant to be placed within proximity to this airport as is proposed, the DMR will be complicit in exacerbating risks to the public at large, without having weighed the adequacy of preventive methods to avert such risks, including specific details of the equipment used and the exact operational practices employed, which the DMR does have explicit responsibility for. In addition, unless some alternative public process is established, through which the air safety aspects of this application are evaluated with equal thoroughness and openness as the DMR applies to overseeing its "mandated criteria", this matter of grave public concern to Maine residents and visitors, will possibly again be dealt with "behind closed doors" by the two Federal Agencies responsible for the Air Safety aspects of this lease.

In summary, I urge you to deny approval of the proposed lease. I also request that the DMR advocate for the establishment of a **publicly open process** by the US Army Corps of Engineers and FAA to deal with permitting the use of suspended aquaculture at this location.

Sincerely,

William S. Stockman
580 Oak Point Rd.
Trenton, Maine, 04605

RECEIVED
JUL 25, 2016
Maine Department of Marine Resources

July 20, 2016

Maine Department of Marine Resources

Attention: Aquaculture Hearing Officer

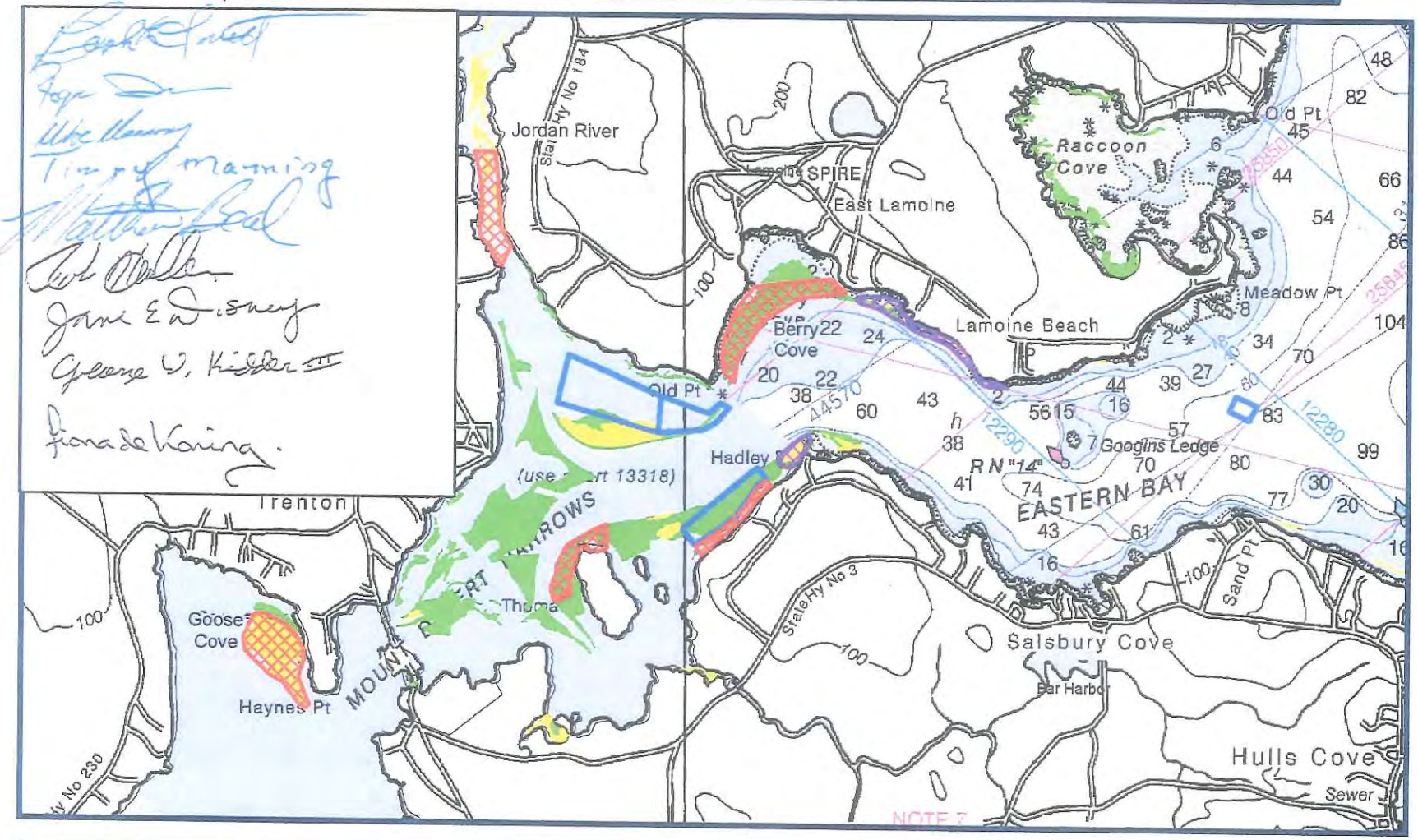
While aquaculture is very important to the state of Maine I find it difficult to understand why any person would decide to place a site for aquaculture next to a busy airport. Maine is blessed with many, many miles of coastline and coves that would be suitable for aquaculture therefore the idea to even propose a site within 2 miles of a small but very busy airport seems unnecessary and a huge safety concern. The Bar Harbor Oyster site is directly under a runway approach and in the way of seaplanes. These oyster farms are notorious bird attractions and therefore make bird strikes much more likely. This situation makes a safety issue for people in the air and on the ground.

I believe in the interest of safety the oyster farm should be located at another place which would not endanger the public.

Sincerely, Kimberly Nadel 31 Osprey Lane, Trenton, Maine 04605

EXHIBIT
Mills
9
Eelgrass Map

Proposed Upper Frenchman Bay Eelgrass Restoration



Legend
- Proposed Restoration 2013
- Donor Sites
- Frenchman_Bay_Farms
- Eelgrass 2008
- Eelgrass 1996

N

Data Sources: ME Office of GIS,
Seth Barker, DMR 2008 aerial photo
Jane Disney, MDIBL 2011 Eelgrass Restoration Polygon
January 31, 2013

0 2,500 5,000 10,000 Feet