

Department of Marine Resources
Site Review #2015-14

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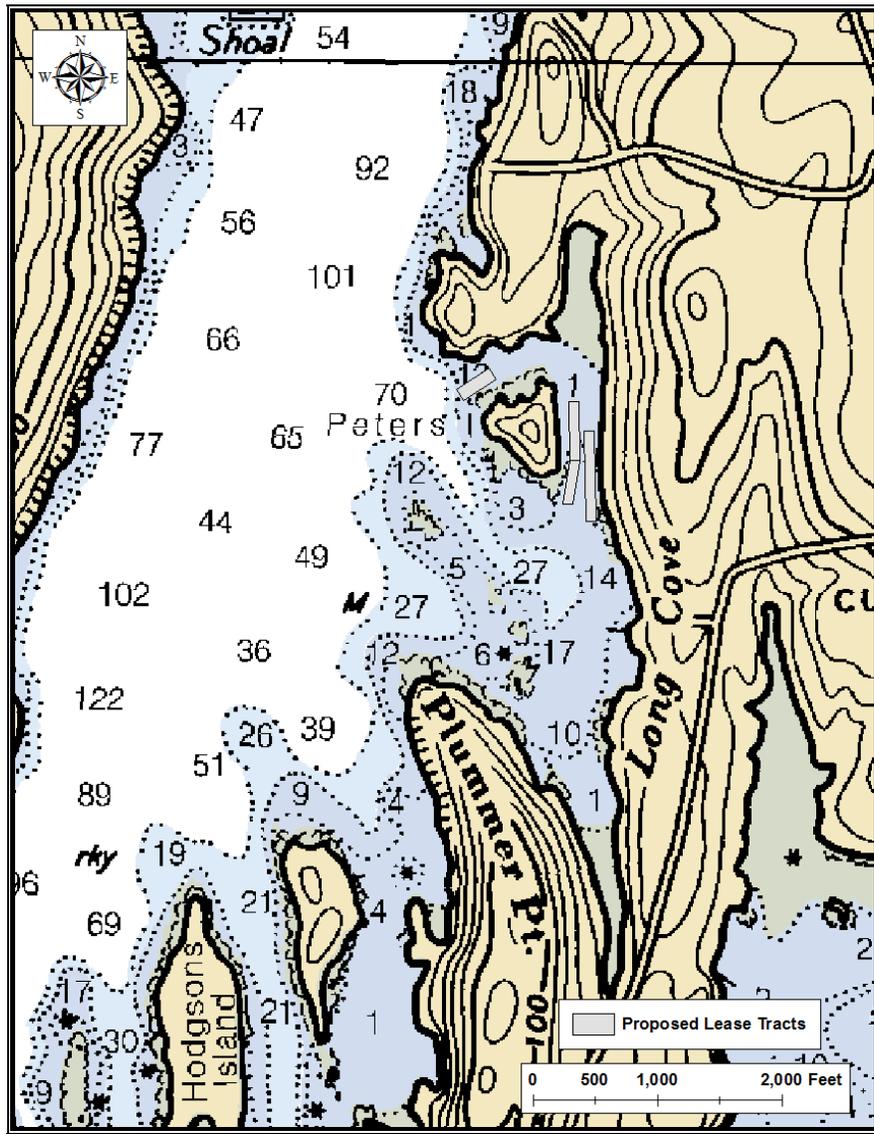


Figure 1: Vicinity map created in ArcMap version 10.2 using digitized NOAA Chart #13293.

Location: North and East of Peter's Island, Damariscotta River, South Bristol, Lincoln County

Purpose: Suspended culture of American oysters (*Crassostrea virginica*) – October through April

Site Review: Jon Lewis and Marcy Nelson
Report Preparation: Jon Lewis and Marcy Nelson

May 20, 2016

On April 6, 2016 Maine Department of Marine Resources (MDMR) scientists Jon Lewis and Marcy Nelson conducted a site assessment of the proposed aquaculture lease. Staff arrived on site at 9:45 a.m.

The applicant is applying for a standard (10-year) lease to over-winter American oysters in an estimated 1,559 OysterGro™ cages deployed in parallel strings of up to 50 cages each and spaced over 4 lease tracts. Each OysterGro™ cage measures 68”L X 43”W X 20”H. Presently, the applicant holds 2 smaller experimental aquaculture leases (DAM PI and DAM PI2) for the culture of shellfish within the boundaries of the current proposal (Figure 2). At the time of the Department’s site assessment, several strings of OysterGro™ cages were observed within the boundaries of the applicant’s current lease sites (Images 1 - 3).

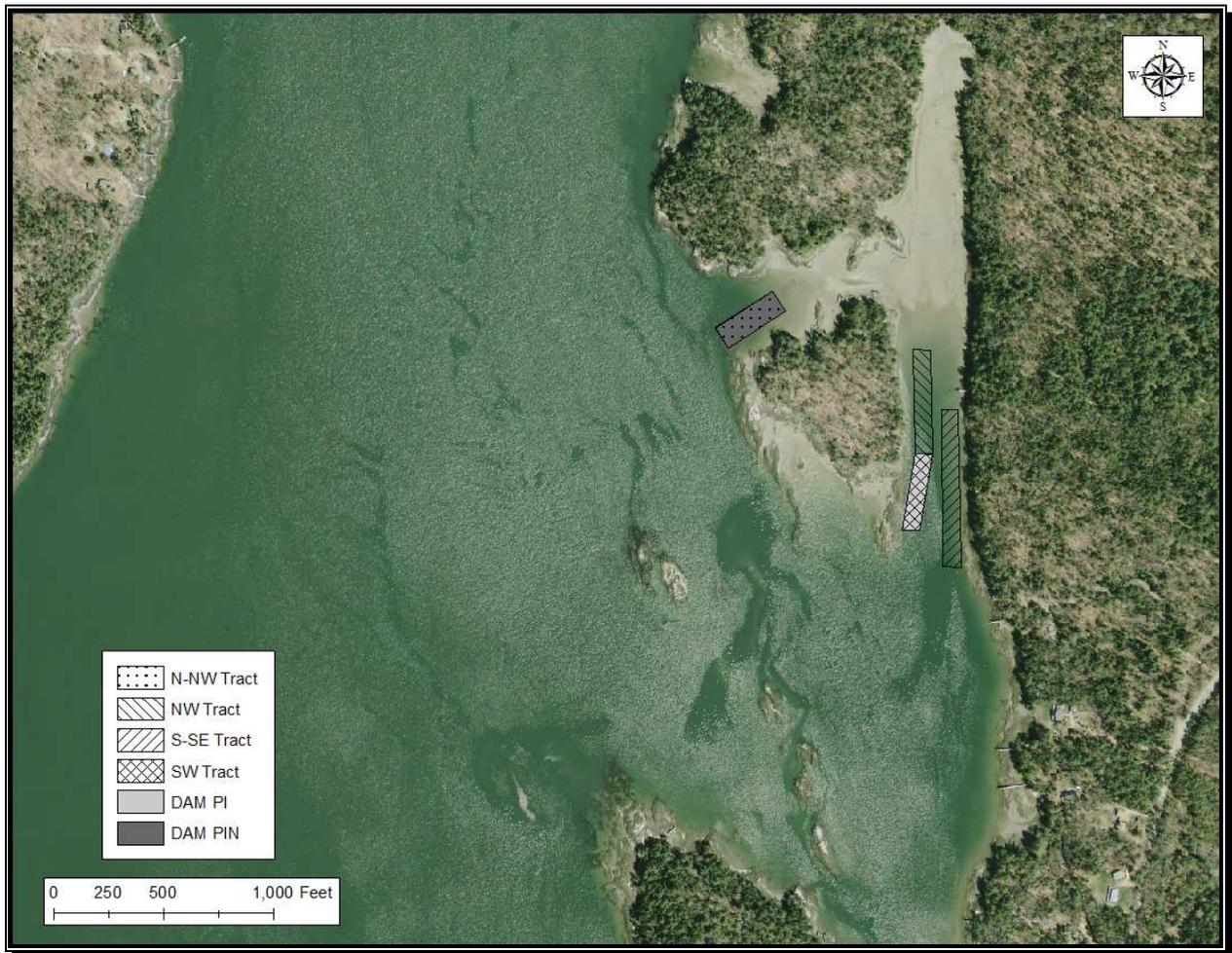


Figure 2: Vicinity map created in ArcMap version 10.2 using geo-referenced aerial photographs provided by The Maine Office of GIS (Low Tide 2013).



Image 1: Strings of OysterGro™ cages within the proposed N-NW Tract/DAM PIN (April 6, 2016).



Image 2: View looking south through the proposed NW and SW Tracts, including OysterGro™ cages within lease DAM PI (April 6, 2016).



Image 3: Close-up of OysterGro™ cages within the proposed SW Tract/DAM PI (April 6, 2016).

General Characteristics

Bottom Topography and Sediment Composition

Throughout the majority of the proposed lease area, the bottom is characterized by a substantial layer of fine sediments with little topographical variation. The relative abundance of leaf litter and unattached filamentous algae suggest a low-current depositional area. Sediment composition is coarser and includes rock, cobble, and shell over a layer of firm mud and sand in the shallow subtidal waters between the proposed lease areas and the mainland/Peter's Island.

Depth

East Boothbay, Damariscotta River, Maine¹

43.8650° N, 69.5833° W

April 6, 2016

Low Tide	04:31 EDT	-0.93 feet
High Tide	10:42 EDT	10.63 feet
Low Tide	16:56 EDT	-1.19 feet
High Tide	23:07 EDT	10.88 feet

¹<http://tbone.biol.sc.edu/tide/index.html>

The predicted time of high tide was 10:42 a.m. Tidal height was predicted at 10.63 feet above mean low water (MLW). Depths within the proposed lease site were collected between 10:27 and 11:44 am. (Dive 1, max depth 22', avg depth 11'; Dive 2, max depth 25', avg depth 19') using dive computers.

Water depths at MLW are conducive to the use of the cages and lines described above.

Position and Distances to Shore

On April 6, 2016 the proposed lease site was marked with orange buoys.

The application coordinates and metes and bounds describing the proposed standard lease are below. In an email to the Department, dated April 17, 2016, the applicant provided revised coordinates for the proposed S-SE Tract. The stated intent of the revision was "...to provide some more space between Mr. Lamia's existing dock and the northern boundary of the southeast tract." According to the applicant these revised coordinates were used to place the buoys observed by MDMR on April 6, 2016.

POSAID Positioning Software was used to verify the distances and bearings between corners. Distances to shore were determined using the measuring tool in ArcMap 10.2, NOAA Chart #13293, Garmin MapSource charting software, digital orthophotography provided by the Maine Office of GIS, and the application coordinates listed below.

Application and Revised Coordinates (Datum NAD83/WGS84) – 3.66 acres (Figure 3)

N-NW Tract – 0.80 acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>
NW	43° 54' 34.03"N	69° 33' 59.92"W then 312.39 feet at 56.78° True to
NE	43° 54' 35.72"N	69° 33' 56.35"W then 111.62 feet at 146.57° True to
SE	43° 54' 34.80"N	69° 33' 55.51"W then 313.00 feet at 236.86° True to
SW	43° 54' 33.11"N	69° 33' 59.09"W then 111.22 feet at 326.89° True to NW.

NW Tract – 0.88 acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>
NW	43° 54' 33.10"N	69° 33' 47.60"W then 81.26 feet at 90.00° True to
NE	43° 54' 33.10"N	69° 33' 46.49"W then 474.12 feet at 178.23° True to
SE	43° 54' 28.42"N	69° 33' 46.29"W then 81.26 feet at 270.00° True to
SW	43° 54' 28.42"N	69° 33' 47.40"W then 474.12 feet at 358.23° True to NW.

SW Tract – 0.65 acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>
NW	43° 54' 28.42"N	69° 33' 47.40"W then 81.26 feet at 90.00° True to
NE	43° 54' 28.42"N	69° 33' 46.29"W then 354.75 feet at 189.02° True to
SE	43° 54' 24.96"N	69° 33' 47.05"W then 81.26 feet at 270° True to
SW	43° 54' 24.96"N	69° 33' 48.16"W then 354.75 feet at 09.02° True to NW.

S-SE Tract Application – 1.34 acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>
NW	43° 54' 30.74"N	69° 33' 45.84"W then 81.26 feet at 90.00° True to
NE	43° 54' 30.74"N	69° 33' 44.73"W then 719.22 feet at 178.42° True to
SE	43° 54' 23.64"N	69° 33' 44.46"W then 81.26 feet at 270.00° True to
SW	43° 54' 23.64"N	69° 33' 45.57"W then 719.22 feet at 358.42° True to NW.

S-SE Tract Revised – 1.33 acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>
NW	43° 54' 30.42"N	69° 33' 45.80"W then 78.34 feet at 90.74° True to
NE	43° 54' 30.41"N	69° 33' 44.73"W then 720.23 feet at 178.43° True to
SE	43° 54' 23.30"N	69° 33' 44.46"W then 83.48 feet at 271.39° True to
SW	43° 54' 23.32"N	69° 33' 45.60"W then 719.10 feet at 358.83° True to NW.

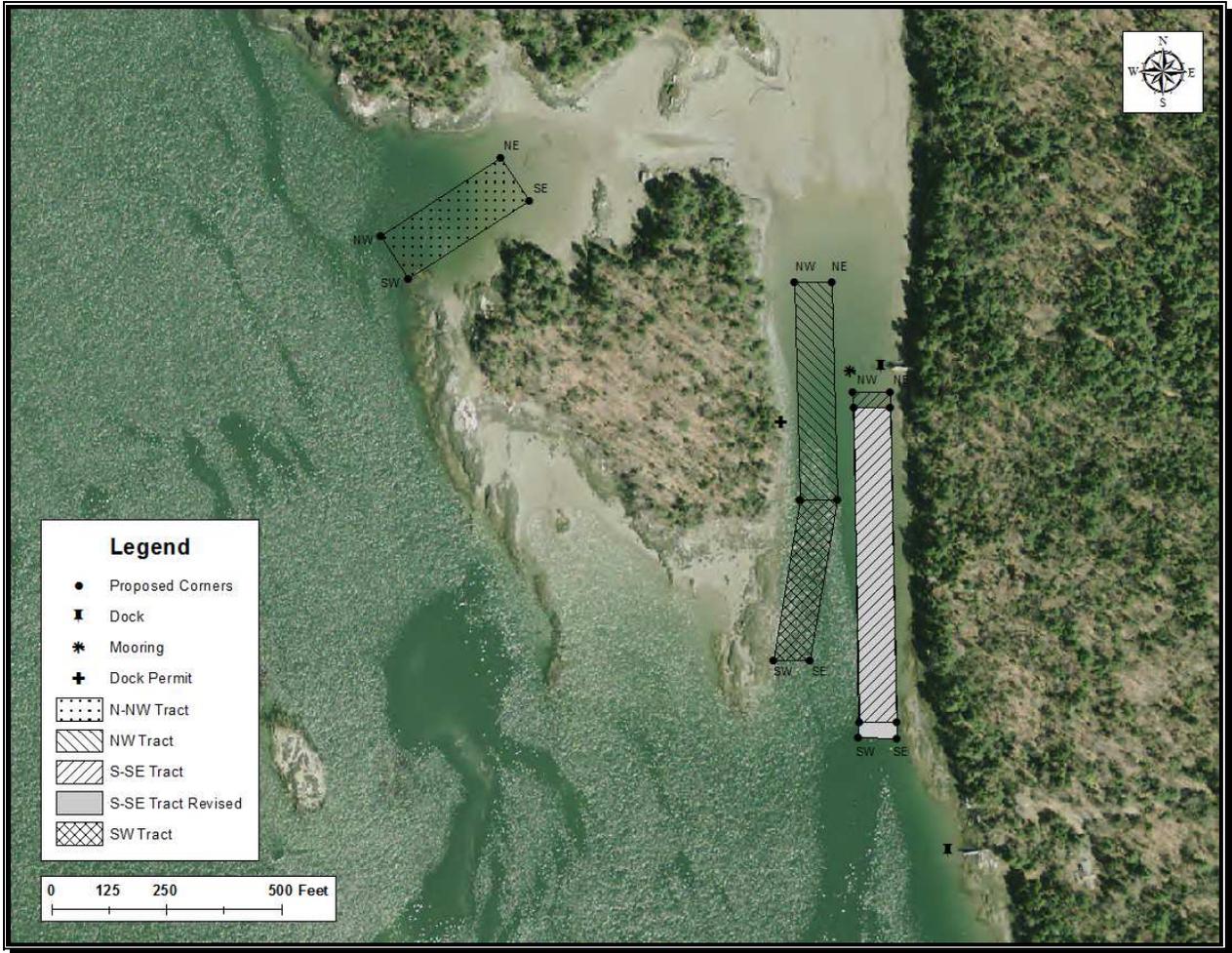


Figure 3: Proposed lease tracts in relation to nearby docks and moorings. Map created in ArcMap version 10.2 using geo-referenced aerial photographs provided by The Maine Office of GIS (Low Tide 2013).

Approximate Distances to shore (Figure 3):

N-NW Tract

NE Corner to Nearest Point, Mainland (MLW)	~80 feet
NW Corner to Nearest Point, Mainland (MLW)	~230 feet
NW Corner to Western Shore, Damariscotta River (MLW)	~2,660 feet
NW Corner to Navigational Channel, Damariscotta River	~100 feet
SE Corner to Nearest Point, Mainland (MLW)	~95 feet
SW Corner to Nearest Intertidal Ledges (MLW)	~10 feet

NW/SW Tracts

NW Corner to Nearest Point, Peter's Island (MLW)	~70 feet
Western Boundary to Nearest Point, Peter's Island (MLW)	~17 feet
NE Corner to Nearest Point, Mainland (MLW)	~185 feet
Eastern Boundary to Nearest Point, Mainland (MLW)	~130 feet
SE Corner to Nearest Point, Mainland (MLW)	~188 feet
Eastern Boundary of NW Tract to Dock	~102 feet

S-SE Tract

NE Corner to Nearest Point, Mainland (MLW)	~24 feet
SE Boundary to Nearest Point, Mainland (MLW)	~25 feet
NW Corner to Nearest Point, Peter's Island (MLW)	~140 feet
NW Corner to Eastern boundary of NW tract	~42 feet
Western Boundary to NW Tract Corner SE	~40 feet
Western Boundary to SW Tract Corner SE	~103 feet
Northern Boundary to Dock	~92 feet
SE Corner to dock to South	~270 feet

The criteria MDMR uses to determine the suitability of an aquaculture operation to a particular area (DMR Regulations Chapter 2.37(1) (A)) are discussed, with respect to the application, below:

(1) Riparian Owners Ingress and Egress

On April 6, 2016 one mooring (“Whitaker” (?)) and one dock were observed within the immediate vicinity of the proposed lease area. No vessel was associated with the mooring at the time of the Department’s site assessment and the neighboring dock did not have an accompanying ramp or float in the water, although a ramp was noted on the pier (Image 4). Two unidentified floats were also observed tied to the northeast shore of Peter’s Island (Image 5). In his December 2, 2015 Intervenor Application, Mr. Thomas Lamia refers to the winter storage of his floats on Peter’s Island.



Image 4: View of neighboring dock and mooring from the NE Corner of the proposed NW Tract (April 6, 2016).



Image 5: Floats secured to the northeast side of Peter’s Island (April 6, 2016).

With the exception of the dock located to the east of the NW Tract and north of the S-SE Tract, the shorelines immediately adjacent to the proposed lease area, including Peter’s Island, are undeveloped. At the time of the Department’s site assessment a parcel of land adjacent to the nearest dock appeared to be undergoing some clearing. This is likely the new house location referenced in the December 2, 2015 Intervenor Application submitted by Mr. Thomas Lamia.

A hand-held GPS unit was used to collect location data for the observed nearest mooring and docks. POSAID Positioning Software and the measuring tool in ArcMap version 10.2 were used to calculate distances and bearings to the proposed lease tracts:

“Whitaker” Mooring (43° 54’ 31.2”N, 69° 33’ 45.9”W) to NW Corner of S-SE Tract: 79.32 feet at 174.70° T

“Whitaker” Mooring (43° 54’ 31.2”N, 69° 33’ 45.9”W) to E Boundary of NW Tract: 36.60 feet at 270.00° T

Nearest Dock (43° 54’ 31.3”N, 69° 33’ 45.0”W) to N boundary of S-SE Tract: 91.95 feet at 180.00° T

Nearest Dock (43° 54’ 31.3”N, 69° 33’ 45.0”W) to E boundary of NW Tract: 102.49 feet at 270.00° T

South Dock (43° 54' 20.9"N, 69° 33' 42.9"W) to SE Corner of S-SE Tract: 268.52 feet at 334.83° T

Mr. Lamia also has an Army Corps of Engineers General Permit for the construction of a ramp and float off the east side of Peter's Island (Corps Permit #NAE-2015-01413). According to the permit, said ramp and float would extend approximately 32 feet below the Mean High Water (MHW) mark. A single coordinate representing the location of the proposed dock (43.9083570°N, 6[9].5633210°W) is provided in the permit and measures 34.6 feet from the western boundary of the proposed NW Tract (Figure 3).

The nearest other developed properties are located more than 260 feet to the south of the proposed S-SE Tract, along the eastern shoreline of Long Cove.

A minimum of 40 feet and a maximum of 103 feet separate the proposed S-SE Tract from the two westerly proposed lease tracts (NW and SW). Between the months of October and May, riparian landowner ingress and egress would be confined to this corridor. While adequate for smaller vessels that can also navigate the area at MLW, larger vessels and those under sail would be limited in maneuverability at any tidal stage.

(2) Navigation

Vessels moving through the main channel of the Damariscotta River, more than 100 feet to the west, would in no way be impeded by the proposed activities.

N-NW Tract (Figure 3):

There remains a minimum of 80 feet of navigable waters between the mainland shore and the northern boundary of the proposed N-NW Tract. Due to the sharp increase in water depths from the mainland shore, small vessels will maintain the ability to navigate around the northern edge of the proposed tract. Access to the inner coves and tidal flats will be limited more by tidal stage and the resulting water depths than the presence of the aquaculture gear, as described. The proposed N-NW tract, if granted will limit access to the northern shore of Peter's Island, particularly at lower tidal stages.

NW, SW, and S-SE Tracts (Figure 3):

If granted, navigation between the eastern shore of Peter's Island and the mainland, between the months of October and May, would be limited to the ~40-103 foot corridor remaining between the NW/SW and S-SE Tracts. Skiffs, canoes, kayaks, etc. would maintain their ability to access the tidally exposed mud flats and shorefront to the north. Larger vessels and sailboats are expected to have some limitations on maneuverability. Considering the narrow span between Peter's Island and the mainland, sailboats entering the area are likely to be small or under auxiliary power. The proposed tracts, if granted, will limit water-borne access to the eastern shore of Peter's Island.

Navigation through this area during the months of October through April would be greatly reduced from what is expected during the summer months.

(3) Fishing

On April 6, 2016 no commercial or recreational fishing was observed within the boundaries of the proposed lease. During the summer months some lobster traps are likely set in these shallow waters. Recreational hook and line fishing for striped bass (*Morone saxatilis*) and, to a lesser extent, mackerel (*Scomber scombrus*) is also expected to occur in the area. During the months when the proposed activities are to take place (October through April), however, limited interference with trap and hook and line fishing would be expected.

According to Cecil Burnham, Harbormaster for the town of South Bristol (Harbormaster Questionnaire, August 18, 2014), “occasional” clam (*Mya arenaria*) harvesting occurs within the surrounding intertidal flats. In his August 9, 2015 response to the Harbormaster Questionnaire for the current application, Mr. Burnham stated there is “little commercial use in close to the proposed area.” The small outboard vessels typically used by clam harvesters to access mudflats are unlikely to be impeded by the proposed lease activities. More than 80 feet of shallow, yet navigable, water will remain to the north of the proposed N-NW Tract and a 42+ foot navigational corridor will be maintained between the NW/SW and S-SE Tracts.

(4) Other Aquaculture Uses

In addition to the two leases currently held by the applicant, there are 4 Limited Purpose Aquaculture licenses (LPAs), 1 aquaculture lease, and 1 pending aquaculture lease within one mile (straight-line distance) of the proposal (Figure 4):

LPAs (.01 acres each)

SHAW1 14 – suspended culture of blue mussels (*Mytilus edulis*) – 221 feet northwest

SHAW2 14 – suspended culture of blue mussels (*Mytilus edulis*) – 248 feet northwest

PCHE3 14 – suspended culture of shellfish and marine algae – 3,730 feet east

PCHE4 14 – suspended culture of shellfish and marine algae - 3,730 feet east

BAR2 15 - suspended culture of marine algae – 1.42 miles northwest

BAR3 15 – suspended culture of marine algae – 1.42 miles northwest

Leases

JOHN NB2 (4.20 acres) – bottom culture of shellfish – 4,626 feet northeast

DAM CC2 (11.99 acres) – suspended culture of blue mussels (*Mytilus edulis*) and marine algae – 1.23 miles northwest

DAM LW2 (1.79 acres) – suspended and bottom culture of shellfish and marine algae – 1.64 miles northwest

Pending Lease

John’s River Shellfish (2.63 acres) – suspended and bottom culture of shellfish – 3,615 feet east

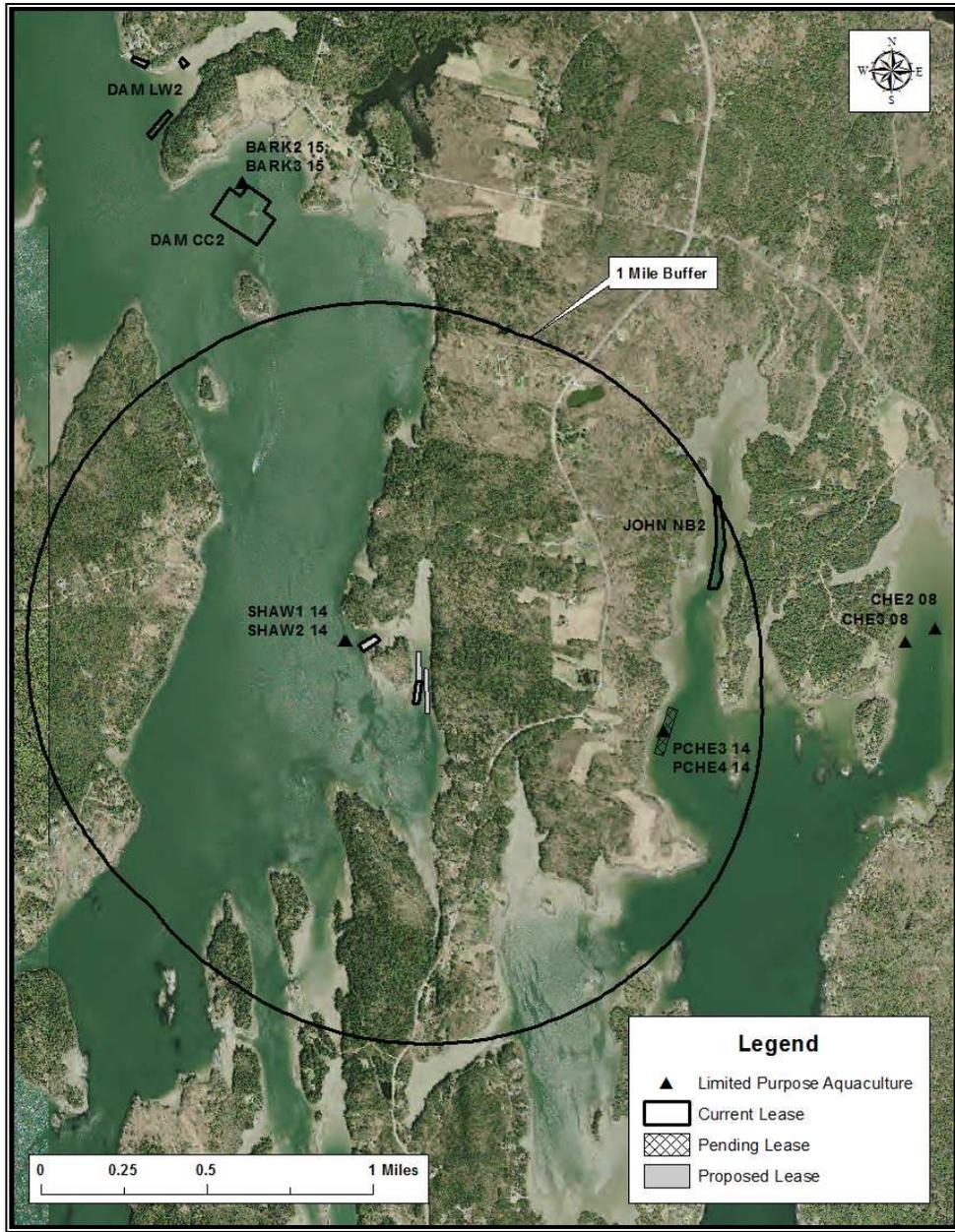


Figure 4: Current and pending aquaculture operations in relation to the proposal. Map created in ArcMap version 10.2 using geo-referenced aerial photographs provided by The Maine Office of GIS (Low Tide 2013).

(5) Existing System Support

A) Flora and fauna from underwater video observations

On April 6, 2016, Maine Department of Marine Resources (MDMR) staff documented the benthic ecology within the proposed lease area using SCUBA observations and a hand-held digital video recorder contained within an underwater housing (see Figure 5 for a graphic representation of the approximate course followed).



Figure 5: Map depicting the general course of the MDMR SCUBA assessment conducted on April 6, 2016 (created in ArcMap version 10.2 using geo-referenced aerial photographs provided by The Maine Office of GIS (Low Tide 2013)).

The bottom within the proposed lease areas is generally characterized by soft mud bottom habitat with an overlay of diatom mats, filamentous algae, and leaf litter. Crabs and snails were the dominant species observed, although their presence was most notable in the shallows closer to Peter’s Island and the mainland where sediment composition was significantly coarser.

The relative abundance of epibenthic macro- flora and fauna observed throughout the video transects is described below.

S-SE to SW to NW Tract:

- American oyster (*Crassostrea virginica*) – occasional
- Beggiatoa sp.* – occasional
- Brown benthic diatoms – abundant
- Filamentous brown, red, and green seaweeds – abundant
- Green crab (*Carcinus maenas*) – occasional
- Horseshoe crab (*Limulus polyphemus*) – shell only, occasional
- Knotted wrack (*Ascophyllum nodosum*) – unattached and occasional

Maned nudibranch (*Aeolidia papillosa*) – occasional
Periwinkle (*Littorina sp.*) – common nearshore
Rock crab (*Cancer sp.*) – occasional
Sea Squirt (*Molgula sp.*) – occasional
Sugar Kelp (*Saccharina latissima*) – unattached and occasional

N-NW Tract:

Barnacle (*Balanus sp.*) – occasional on rock
Brown benthic diatoms - abundant
Burrowing anemone (*Edwardsia sp.*) – occasional
Comb jelly, common northern (*Bolinopsis infundibulum*) – occasional
Filamentous brown, red, and green seaweeds – abundant
Green crab (*Carcinus maenas*) – occasional
Hermit Crab (*Pagurus sp.*) – common to north and east
Horseshoe crab (*Limulus polyphemus*) – shell only, occasional
Knotted wrack (*Ascophyllum nodosum*) – common on rocks near Peter's Island
Periwinkle (*Littorina sp.*) – common to abundant in nearshore shallows
Rock weed (*Fucus vesiculosus*) – common on rocks near Peter's Island
Sea Lettuce (*Ulva lactuca*) – common in shallows near Peter's Island
Smooth cord weed (*Chorda filum*) – occasional
Sugar kelp (*Saccharina latissima*) –



Image 6: Screenshot of characteristic soft sediments and burrow observed within the proposed lease areas, April 6, 2016.



Image 7: Screenshot of characteristic soft sediments observed within the proposed lease areas, April 6, 2016.



Image 8: Screenshot of filamentous algae observed throughout both dive transects, April 6, 2016.



Image 9: Screenshot of bottom to the east of the N-NW Tract, April 6, 2016.

B) Fisheries and Wildlife

According to GIS (Geographic Information System) data maintained by The Maine Department of Inland Fisheries and Wildlife there is a bald eagle (*Haliaeetus leucocephalus*) nest located on Hodgsons Island, more than 4,000 feet to the southwest of the proposed aquaculture lease. The tidal mudflats to the north, south, and west of Peter's Island and in the shallow cove to the north and east of the proposed lease tracts are designated as moderate to high value Tidal Wading Bird and Waterfowl Habitat.

(6) Interference with Public Facilities

There are no publicly-owned beaches, conserved lands, or docking facilities within 1000 feet of the proposed lease.

(7) Lighting

No lighting is proposed for use at this lease site, if granted. An exception would be made for emergency situations such as a boat malfunction.

(8) Noise

The applicant proposes to use a combination of four-stroke and two-stroke outboard engines on vessels tending the site, if granted. These outboards are typical of those used throughout coastal Maine. Four-stroke outboards are the quietest gasoline powered outboards available.

No other powered equipment is proposed for use.

(9) Visual Impact

The applicant proposes to use floating cages and bags to contain the cultured oysters. The surface gear is black in color with black floatation and would protrude a maximum of 20” above the water’s surface, when in the drying position.

(10) Water Quality Classification

The area is currently classified by the Department of Marine Resources Water Quality Classification program as “Open/Approved” for the harvest of shellfish.