

Pemaquid Oyster Company, Inc.
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Purpose: Standard lease for the bottom culture of Eastern/American oysters (*Crassostrea virginica*), European oysters (*Ostrea edulis*), hard clams (*Mercenaria mercenaria*), Atlantic surf clams (*Spisula solidissima*), and razor clams (*Ensis directus*)

May 8, 2018

¹All figures in this report were created in ArcMap version 10.4 using digitized NOAA Nautical Charts or geo-referenced aerial photographs provided by The Maine Office of GIS.

The applicant, Pemaquid Oyster Company, Inc., is requesting 8.26² acres located near Goose Ledges in the Damariscotta River for the bottom culture of American/eastern oysters (*Crassostrea virginica*), European oysters (*Ostrea edulis*), hard clams (*Mercenaria mercenaria*), Atlantic surf clams (*Spisula solidissima*), and razor clams (*Ensis directus*).

Maine Department of Marine Resources (MDMR) Scientists Jon Lewis, Marcy Nelson, and Flora Drury visited the proposed lease site on April 5, 2018. MDMR staff arrived onsite at 9:50 am and left the site at approximately 11:30 am; the tide was low at the time of arrival.

General Characteristics

The proposed lease area occupies subtidal waters on both sides of the navigation channel in the upper Damariscotta River. Tract 1 of the proposed lease is located to the west of Goose Ledges, off the Damariscotta River's eastern shore. Houses and docks are located on the forested uplands to the north of Tract 1 (Image 2). Tract 2 of the proposed lease is located off the river's rocky and sandy western shore (Images 4 and 5). Multiple houses, along with a mixed forest, are located on the uplands to the west of Tract 2.

Depth

MDMR staff arrived on site and began collecting depths at 9:50 am, roughly one minute before the predicted low tide. At the time of depth collection, the proposed lease site was entirely subtidal. Depths ranging from 9.5 to 10' were observed in the center of Tract 1. Depths ranging from 7 to 9 feet were observed during a transect running from south to north through the center of Tract 2. Correcting for tidal range would derive water depths approximately 8.7 feet higher at the next high tide (15.7-18.7).

Newcastle, Damariscotta River, Maine³

(44.0333° N, 69.5367° W)

Date	Time	Height (ft)
04/05/18	3:20 AM	9.84 H
04/05/18	9:51 AM	0.20 L
04/05/18	3:57 PM	8.91 H
04/05/18	10:03 PM	1.22 L

Bottom Characteristics

On April 5, 2018, a Remotely Operated Vehicle (ROV) was used to observe the bottom of the proposed lease site. Video was collected using the ROV in the southern section of proposed Tract 1; video was not collected in the northern portion of Tract 1 due to active harvesting occurring there and a camera malfunction. The ROV was deployed in the center of Tract 2 and traversed the majority of the tract (Figure 2). Bottom characteristics were categorized using the Coastal and Marine Ecological Classification Standard (CMECS), a national standard for describing features of the marine environment (Table 1). Sediment information was determined based on visual analysis of the video; no

² Applicant originally requested 8.33 acres. DMR calculations, based on the provided coordinates, indicate the area is 8.26 acres.

³ <http://tbone.biol.sc.edu/tide/tideshow.cgi>

sediment samples were taken or grain size analysis performed. The bottom of the southern portion of Tract 1 is composed of fine unconsolidated substrate, primarily firm mud and sand. Shell hash was also observed. Slightly gravelly sandy mud with co-occurring woody debris was observed on the bottom of Tract 2.

Table 1: Bottom characteristics of proposed site

Tract Number	Substrate Origin	Substrate Class	Substrate Subclass	Substrate Group	CMECS Code	Co-Occurring Element
Tract 1	Geologic Substrate	Unconsolidated Mineral Substrate	Fine Unconsolidated Substrate	Sandy Mud	S1.2.2.4	Shell Hash (S2.5.3)
Tract 2	Geologic Substrate	Unconsolidated Mineral Substrate	Fine Unconsolidated Substrate	Slightly Gravelly Sandy Mud	S1.2.2.1.2	Woody Debris (S2.1.2)



Image 1: Facing northeast from northern portion of Tract 1 (April 5, 2018).



Image 2: Facing north from northern portion of Tract 1 lease (April 5, 2018).



Image 3: Facing southeast from northern portion of Tract 1 (April 5, 2018).



Image 4: Facing north from center of Tract 2 (April 5, 2018).



Image 5: Facing west from center of Tract 2 (April 5, 2018).



Image 6: Facing southeast from center of Tract 2 (April 5, 2018).

Position and Distances to Shore

POSAID Positioning Software was used to verify the distances and bearings between proposed lease corners. Distances to shore were determined using the measuring tool in ArcMap 10.4, digitized NOAA Nautical Charts, digital orthophotography provided by the Maine Office of GIS, and the application coordinates.

Application Coordinates – 8.26 Acres (Figure 2)

Tract 1: 6.49 Acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>
1	44° 01' 01.58"N	69° 32' 33.85"W then 405.07 feet at 284.77° True to
2	44° 01' 02.60"N	69° 32' 39.21"W then 611.02 feet at 226.55° True to
3	44° 00' 58.45"N	69° 32' 45.28"W then 473.36 feet at 211.87° True to
4	44° 00' 54.48"N	69° 32' 48.70"W then 552.23 feet at 182.05° True to
5	44° 00' 49.03"N	69° 32' 48.97"W then 167.94 feet at 112.70° True to
6	44° 00' 48.39"N	69° 32' 46.85"W then 214.54 feet at 23.70° True to
7	44° 00' 50.33"N	69° 32' 45.67"W then 180.40 feet at 293.14° True to
8	44° 00' 51.03"N	69° 32' 47.94"W then 558.78 feet at 22.45° True to

9	44° 00' 56.13"N	69° 32' 45.02"W then 641.36 feet at 38.89° True to
10	44° 01' 01.06"N	69° 32' 39.51"W then 398.39 feet at 106.63° True to
11	44° 01' 00.20"N	69° 32' 34.19"W then 141.93 feet at 10.08° True to Corner 1.

Tract 2: 1.77 Acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>
12	44° 00' 52.50"N	69° 32' 53.53"W then 199.70 feet at 109.24 True to
13	44° 00' 51.85"N	69° 32' 50.95"W then 352.11 feet at 183.69° True to
14	44° 00' 48.38"N	69° 32' 51.26"W then 256.77 feet at 289.11° True to
15	44° 00' 49.21"N	69° 32' 54.58"W then 341.87 feet at 12.97° True to Corner 12.

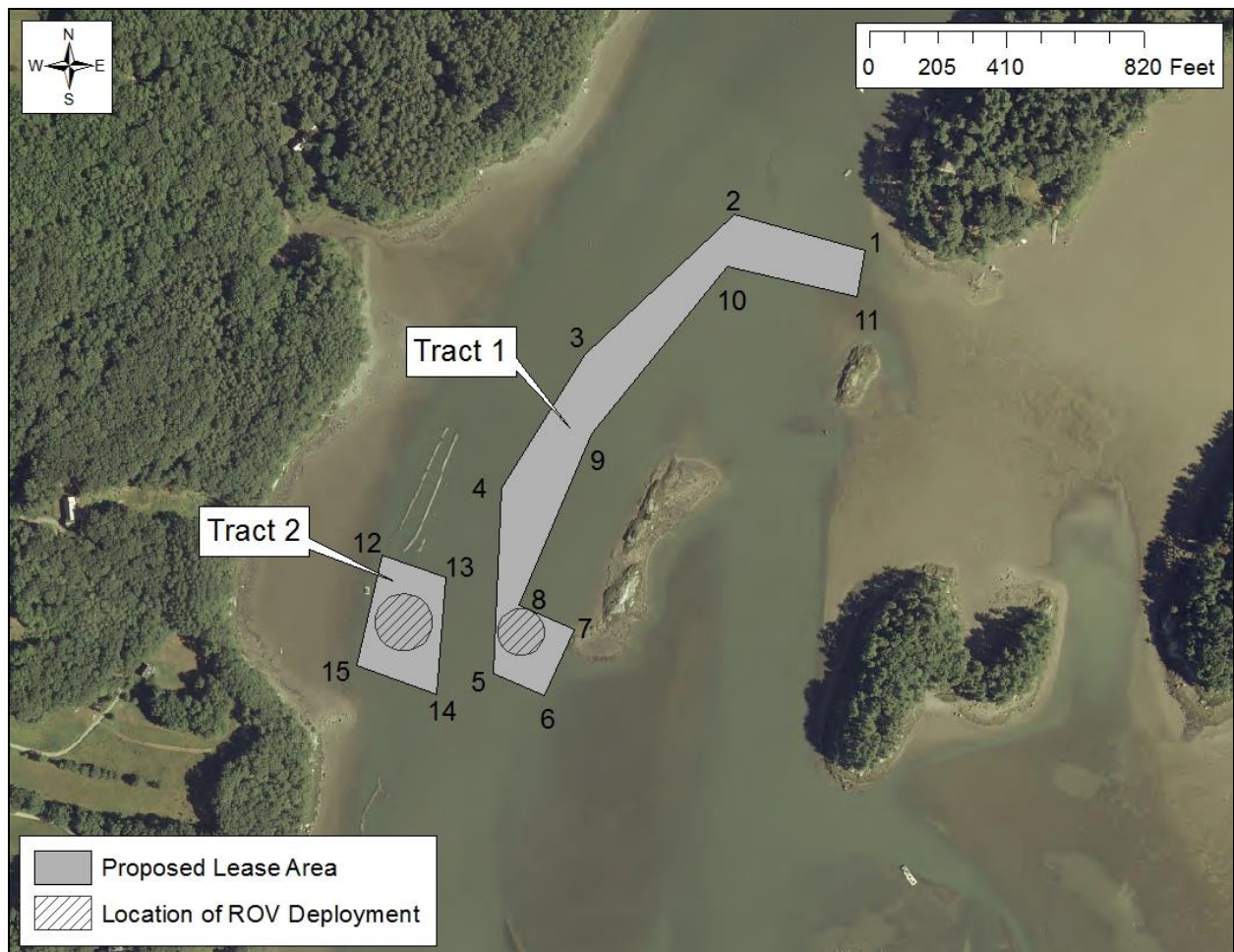


Figure 2: Proposed lease area using geo-referenced aerial photographs provided by The Maine Office of GIS (Low_Tide_2004).

Approximate Distances to Shore (Figures 1 & 2)

Corner 1 to Nearest Mainland (MLW)	~105 feet to the northeast
Corner 5 to West Side of Damariscotta River (MLW)	~440 feet to the west
Corner 6 to Hog Island (MLW)	~835 feet to the east
Boundary 6-7 to Goose Ledge (MLW)	<2 feet to the east
Corner 9 to East Side of Damariscotta River (MHW)	~1,885 feet to the east
Corner 12 to West Side of Damariscotta River (MHW)	~370 feet to the west
Corner 14 to Hog Island (MLW)	~1,135 feet to the east
Corner 15 to West Side of Damariscotta River (MLW)	~100 feet to the west
Tract 1 to Nearest Point Tract 2	~155 feet to the west
Tract 1 to Nearest Dock	~210 feet to the north

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

(1) Riparian Ingress and Egress

Houses, stairways providing shoreline access, and docks are located to the north of proposed Tract 1 on the Damariscotta River's eastern shore. The closest dock is located ~210 feet to the north of the proposed lease (Image 7). Due to the date of MDMR's site visit, a ramp and float were not yet installed and therefore any vessels associated with this property were not observed. A stairway leading down the steep upland to the water is located next to the dock, approximately 205 feet to the north of the proposed lease (Image 7). A kayak was observed nearby this stairway indicating that riparian owners launch hand-carry vessels from this shoreline.

Multiple residences are located along the Damariscotta River's western shoreline, which is roughly parallel to Tract 2 of the proposed lease. No docks or stairways were observed on the western shore of the Damariscotta River in the vicinity of the proposed lease. At its closest point, Tract Two is located ~100 feet from the Damariscotta River's western shoreline at mean low water.

It is unlikely that the proposed lease will interfere with riparian ingress and egress because no gear, other than marker buoys, will be present on either proposed tract. In addition to this, the distances available between riparian property and the proposed lease site are adequate for vessels that likely transit the area.



Image 7: Houses, docks, and stairways to the north of, and nearest to, Tract 1 (April 5, 2018).

(2) Navigation

The proposed lease is located approximately one mile south of the bridge that connects the towns of Damariscotta and Newcastle (Image 1). Boats regularly navigate this section of the Damariscotta River for both commercial and recreational purposes. The majority of the proposed lease is located in the shallow water that borders the main navigation channel, however, the western side of Tract 1 and the eastern side of Tract 2 both extend into the deepest part of the channel. Tract 1 and Tract 2 are separated by approximately 155 feet.

Except for times when harvest is occurring via boat drawn drag, it is unlikely that navigation will be impacted by the proposed lease since no gear, other than marker buoys, would be present. When harvest via drag is conducted on the lease, navigation in the area may be altered but will not be prevented.

(3) Fishing

On April 5, 2018, a clam harvester was observed to the west of proposed Tract 2, digging in the intertidal flats along the shoreline. The proposed lease is entirely subtidal and therefore would not impede commercial and recreational harvesters from utilizing these shorelines on either side of the river.

No other commercial or recreational fishing activities were observed in the immediate vicinity, although recreational fishing is known occur in the area from both boat and shore. Except during

the time when Pemaquid Oyster Company, Inc. would be actively working on the site, the proposal is unlikely to hinder recreational fishing in the area as no surface gear is proposed.

(4) Other Aquaculture Uses

There are thirteen active or pending aquaculture leases and nineteen active Limited Purpose Aquaculture (LPA) licenses within one mile of the proposed lease site (Figure 3). Table 2 lists leases and licenses within 1000 feet of the proposal. At the time of MDMR's site visit, work was being conducted on some of the nearby leases and LPA licenses.

Two active LPA licenses are located within Tract 2 of the proposed lease. These LPAs are held by Mary Steele for the surface culture of American/eastern oyster (*C. virginica*). The applicant plans to drag harvest from the proposed lease, and therefore it is unlikely that the existing LPA licenses and Tract 2 the proposed lease could coexist. The Department notified Mary Steele of the proposed lease on November 14, 2017.

The applicant holds the nearest aquaculture lease to the proposed site. This lease, DAM GL3, borders the west side of proposed Tract 1 and is licensed for the bottom culture of American/eastern oysters (*C. virginica*). At the time of MDMR's site visit, the applicant was dragging on DAM GL3 from the F/V Oyster Girl.

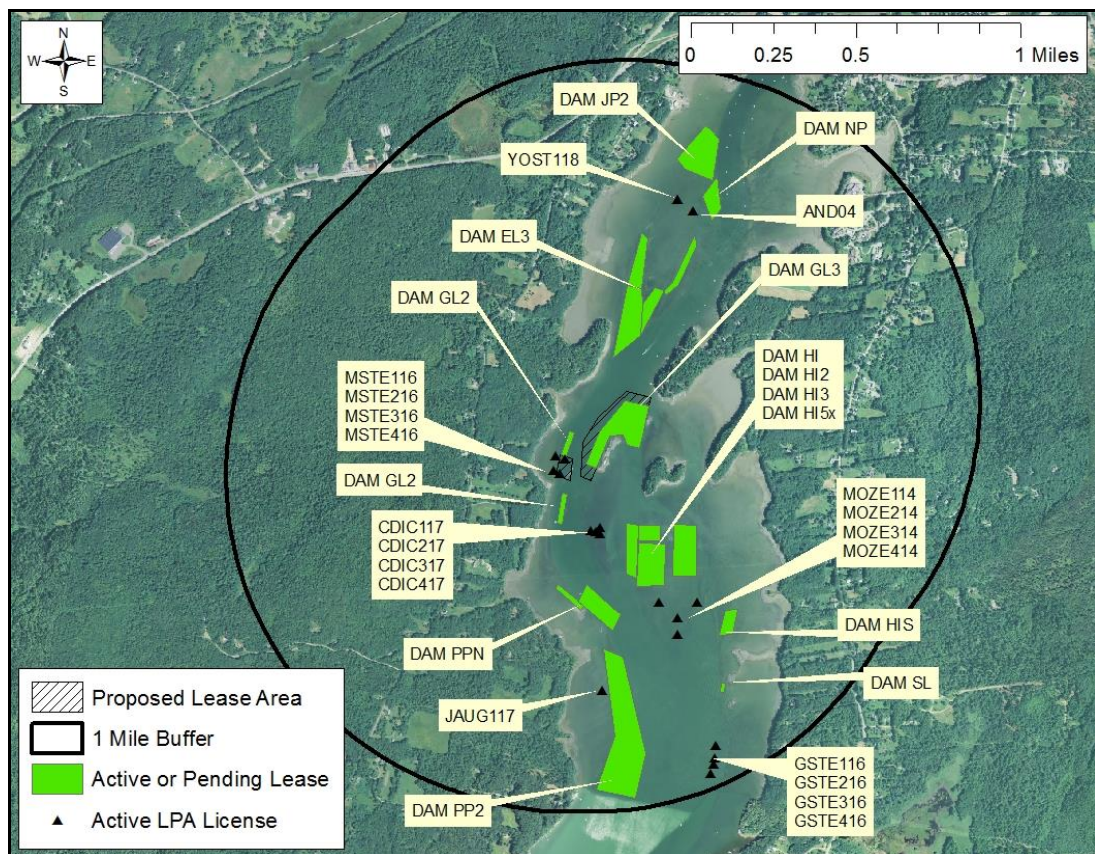


Figure 3: Active and pending aquaculture leases and licenses nearby proposed lease site using aerial photographs provided by The Maine Office of GIS (NAIP_2013).

Table 2: Active and pending aquaculture leases/licenses within 1,000 feet of the proposed lease

Lease/License Acronym	Lease/License Holder	Acreage	Purpose	Distance From Proposed Lease (Ft)
MSTE216	Mary Steele	LPA	Suspended Culture of Shellfish	Within Tract 2
MSTE416	Mary Steele	LPA	Suspended Culture of Shellfish	Within Tract 2
DAM GL3	Pemaquid Oyster Company	10.14	Bottom Culture of Shellfish	Bordering Tract 1
DAM GL2	Pemaquid Oyster Company	1.8	Suspended/Bottom Culture of Shellfish	13 ft
MSTE316	Mary Steele	LPA	Suspended Culture of Shellfish	46 ft
MSTE116	Mary Steele	LPA	Suspended Culture of Shellfish	74 ft
DAM EL3	Mook Sea Farms	15.17	Suspended/Bottom Culture of Shellfish	571 ft
CDIC417	Christopher Dickinson	LPA	Suspended Culture of Shellfish	749 ft
CDIC117	Christopher Dickinson	LPA	Suspended Culture of Shellfish	784 ft
CDIC317	Christopher Dickinson	LPA	Suspended Culture of Shellfish	803 ft
CDIC217	Christopher Dickinson	LPA	Suspended Culture of Shellfish	860 ft
DAM HI5x	Dodge Cove Marine Farm	3.55	Bottom Culture of Shellfish	876 ft

(5) Existing System Support

On April 5, 2018 a Remotely Operated Vehicle (ROV) was used to document the epibenthic ecology of the surrounding area. Figure 2 displays the approximate location of where the ROV was deployed on each tract of the proposed site. The section of Tract 1 observed by MDMR staff was composed primarily of firm mud and sand substrate (Image 8). Gravel, firm mud, and sand was observed on Tract 2 (Image 9). The relative abundance of epibenthic macro flora and fauna observed throughout the video transects is described below.

Species and Abundances

Hermit crab (<i>Pagurus sp.</i>) - common
Brushy Red Weeds <i>Gracilaria spp./Agardhiella spp./Ceramium spp.</i>) - rare
American oyster (<i>Crassostrea virginica</i>) – common (Tract 1) to abundant (Tract 2)
Filamentous algae (<i>Ectocarpus/Cladophora</i>) - abundant
Sea lettuce (<i>Ulva sp.</i>) - rare
Rockweed (<i>Fucus sp.</i>) - rare
Bryozoan (Phylum <i>Bryozoa</i>) - abundant
Sponge (Phylum <i>Porifera</i>) - common

Smooth Chord Weed (<i>Chorda filum</i>) - rare
Laver (<i>Porphyra sp.</i>) - rare



Image 8: Bottom of proposed Tract One (April 5, 2018).



Image 9: Bottom of proposed Tract Two (April 5, 2018).

Eelgrass (*Zostera marina*)

According to data collected by the Maine Department of Marine Resources, the closest historical record of eelgrass to the proposed lease site was observed in 2005 and located over 3,000 feet to the south (Figure 4). No eelgrass was observed during the Department's underwater site assessment on April 5, 2018.

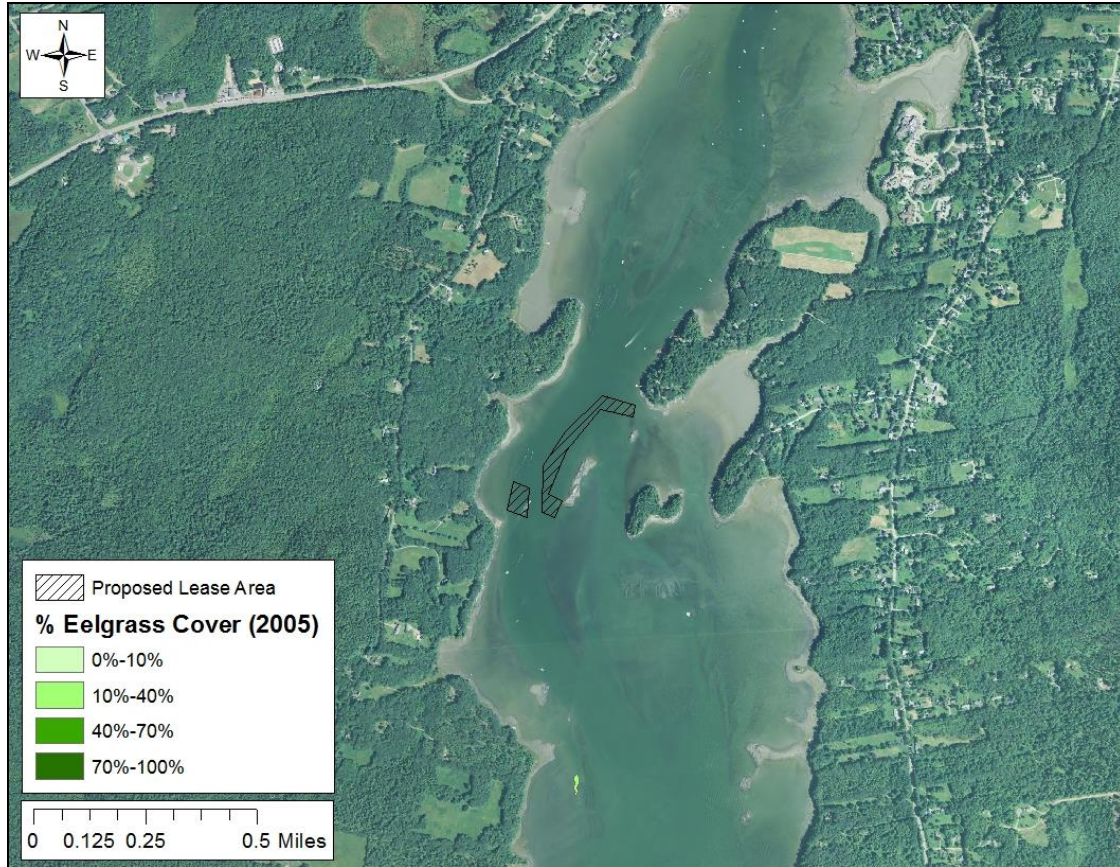


Figure 4: Historical records of eelgrass (*Z. marina*) in the vicinity of the proposed lease area using aerial photographs provided by The Maine Office of GIS (NAIP_2013).⁴

Wildlife

Bald eagles (*Haliaeetus leucocephalus*), herring gulls (*Larus argentatus*), and a common loon (*Gavia immer*) were observed during MDMR's site review on April 5, 2018.

According to GIS (Geographic Information System) data maintained by MDIF&W and available through the Maine Office of GIS, the majority of proposed Tract 1 lies within the mapped habitat of a bald eagle (*H. leucocephalus*) nest located to the east of the site (Figure 5). Additionally, the intertidal areas to the east and west of the proposed lease tracts are categorized as Tidal Wading Bird and Waterfowl Habitat (Figure 5). Tidal Wading Bird and Waterfowl Habitat is defined under Maine's Natural Resources Protection Act (NRPA) as Significant Wildlife Habitat.

⁴ Figure created using data sourced from The Maine Office of GIS (Eelgrass 2010).

In an email dated November 17, 2017 John Perry, an Environmental Review Coordinator for MDIFW, stated that “minimal impacts to wildlife are anticipated” from the proposed lease.

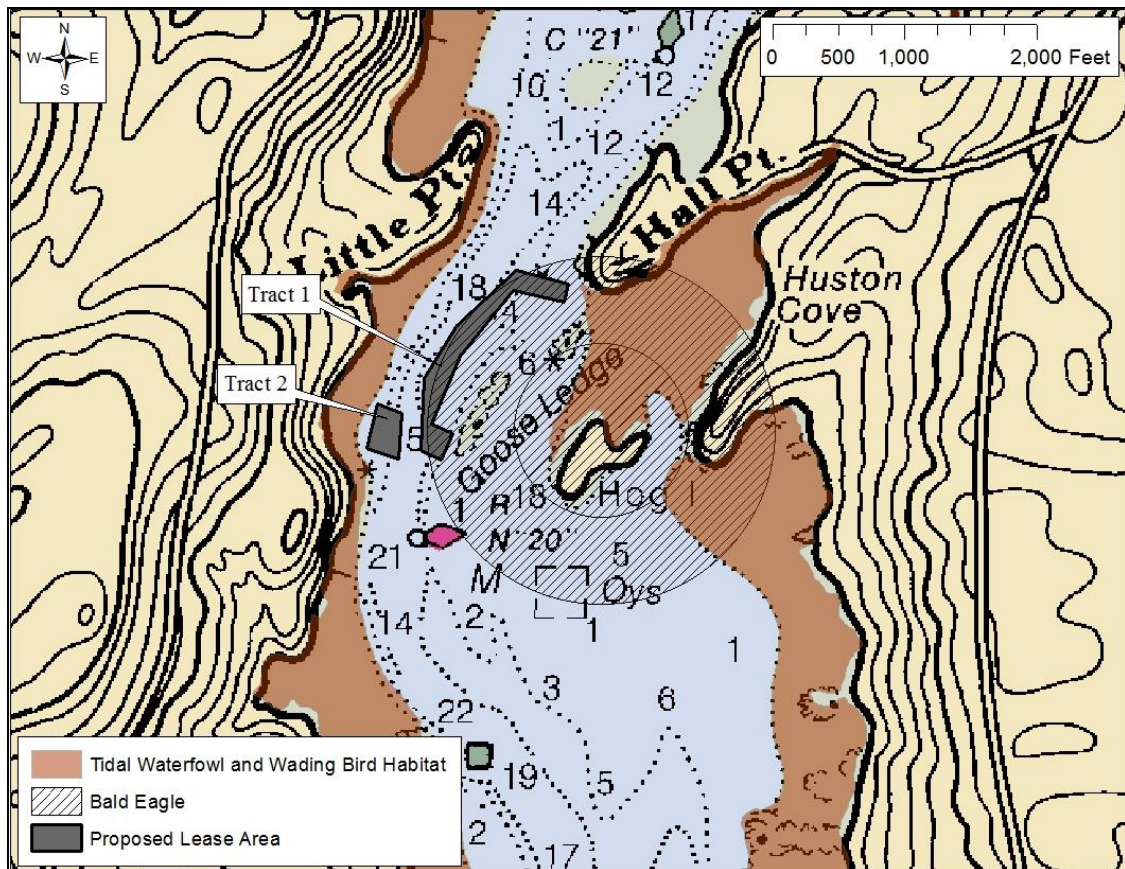


Figure 5: Endangered, Threatened, and Species of Special Concern Habitat⁵ and Tidal Wading Bird and Waterfowl Habitat⁶ in the vicinity of the proposed lease site

(6) Interference with Public Facilities

Goose Ledges, located less than two feet to the east of the proposed lease site at mean low water is classified as a “Coastal Island” and managed by the Maine Department of Inland Fisheries and Wildlife. In an email dated November 17, 2017 John Perry, an Environmental Review Coordinator for MDIFW, stated that “minimal impacts to wildlife are anticipated” from the proposed lease. The proposed lease is not within 1,000 feet of any other beach, park, docking facility, or conserved lands owned by federal, state, or municipal governments.

(7) Water Quality

The area of the proposed lease site is currently classified as open/approved for the harvest of shellfish.

⁵ Data obtained from MDIWF maintained SDE Feature Class “GISVIEW.MEIFW.ETSC”

⁶ Data obtained from MDIWF maintained SDE Feature Class “GISVIEW.MEIFW.Twwh”

(8) Lighting

The applicant does not plan to install lighting at the proposed site.

(9) Noise

The applicant plans to use a fishing boat powered by a muffled diesel engine to plant and harvest oysters on the proposed lease. According to the applicant, no other powered equipment will be used on the site.

(10) Visual Impact

The applicant is proposing to bottom plant shellfish on the lease site in question. With the exception of marker buoys, no gear is proposed for this site.