

Figure 1. Vicinity map.¹

Location: East of Friendship Long Island, Meduncook River, Friendship, Knox County, Maine

Purpose: Experimental lease for suspended and bottom culture of American/eastern oysters (*Crassostrea virginica*)

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Report Preparation: Chloe Kilborn, Meryl Grady, and Amanda Ellis

¹ Unless otherwise noted, all figures in this report were created in ArcGIS Pro version 2.9 using digitized NOAA Nautical Charts or georeferenced aerial photographs provided by The Maine Office of GIS.

² MDMR site visit on September 6, 2023



Application Overview

The applicant, Joe Cutts, is requesting 2.24³ acres east of Friendship Long Island in the Meduncook River for the suspended and bottom culture of American/eastern oysters (*Crassostrea virginica*). The proposal consists of two tracts separated due to existing eelgrass (*Zostera marina*). The applicant intends to be on site year-round, with less activity in the winter.⁴

General Characteristics

On August 14, 2023, Maine Department of Marine Resources (MDMR) scientists assessed the proposed lease site. MDMR scientists arrived on site at approximately 11:20 AM. The proposal is situated along the eastern shore of Friendship Long Island, consisting of cobble and marsh shoreline with forested uplands. On September 6, 2023, MDMR scientists conducted a second site visit to collect additional information about proposal depths and nearby eelgrass. MDMR scientists arrived on site at 10:30 AM.

Depth

MDMR scientists began collecting depths within the proposal boundaries of Tract 2 at approximately 12:30 PM on August 14, 2023. Measured depths at proposal corners ranged from 12.0 to 13.3 feet. Correcting for tidal variation derives water depths at the corners of Tract 2 at the previous high tide to be from 13.4 to 14.7 feet and from 5.1 to 6.4 feet at mean low water (MLW, 0.0 feet). MDMR scientists collected depths within the proposal boundaries of Tract 1 at approximately 10:30 AM on September 6, 2023. Measured depths at proposal corners ranged from 1.5 feet 3.2 feet. Correcting for tidal variation derives water depths at the corners of Tract 1 at MLW to be from 0.6 to 2.3 feet and from 10.3 to 12.0 feet at the next high tide (Table 1).

Table 1. Predicted tidal heights in Friendship, Maine.⁵

Date	Time	Height (ft)
2023/08/14	4:35 AM	0.4 L
2023/08/14	10:37 AM	8.3 H
2023/08/14	4:35 PM	1.4 L
2023/08/14	10:42 PM	9.6 H
2023/09/06	4:24 AM	9.0 H
2023/09/06	10:29 AM	0.9 L
2023/09/06	4:42 PM	9.7 H
2023/09/06	11:17 PM	0.4 L

³ Applicant originally requested 2.2 acres. MDMR calculations indicate the area is 2.24 acres. Tract 1 is 1.51 acres; Tract 2 is 0.73 acres.

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⁵ <https://www.usharbors.com/harbor/maine/friendship-harbor-me/tides/?tide=2023-09#monthly-tide-chart>



Bottom Characteristics

MDMR scientists observed the bottom characteristics of the proposed lease site via a remotely operated vehicle (ROV) and snorkel transects. Bottom characteristics were categorized using the Coastal and Marine Ecological Classification Standard (CMECS), a national standard for describing features of the marine environment (Table 2). Sediment information was determined based on visual analysis of the video. The bottom of the proposed lease site is composed of mud.

Table 2. Bottom characteristics of the proposed site.

Substrate Origin	Substrate Class	Substrate Subclass	Substrate Group
Geologic Substrate	Unconsolidated Mineral Substrate	Fine Unconsolidated Substrate	Mud

Position and Distances to Shore

The measuring tool in ArcGIS Pro 2.9 was used to verify the distances and bearings between proposed lease corners. Distances to shore were determined using the measuring tool in ArcGIS Pro 2.9, digital orthophotography provided by the Maine Office of GIS, and the application coordinates (Table 3, Figure 2).

Application Coordinates (WGS84) – 2.24 Acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>	
<u>Tract 1 – 1.51 Acres</u>			
NW	43.961133°	-69.336181°	then 209.8 feet at 128° True to
NE	43.960800°	-69.335531°	then 361.2 feet at 189° True to
SE	43.959819°	-69.335725°	then 191.9 feet at 303° True to
SW	43.960106°	-69.336336°	then 376.6 feet at 6° True to NW

Tract 2 – 0.73 Acres

NW	43.963222°	-69.335200°	then 102.4 feet at 90° True to
NE	43.963222°	-69.334811°	then 311.0 feet at 180° True to
SE	43.962369°	-69.334822°	then 101.6 feet at 270° True to
SW	43.962369°	-69.335208°	then 311.0 feet at 0° True to NW



Table 3. Approximate distances from proposed lease corners to surrounding features (Figure 2).

Feature	Distance
Tract 1 NE corner to nearest observed eelgrass patch	~170' to the north
Tract 1 SE corner to nearest float	~192' to the northeast
Tract 1 SW corner to applicant's float/pier	~2' to the west
Tract 1 NW corner to subtidal ledge	~90' to the north
Tract 2 SE corner to nearest float	~122' to the south
Tract 2 SW corner to nearest lobster buoy	~150' to the northwest
Tract 2 SW corner to Friendship Long Island shoreline at MLW	~120' to the west
Tract 2 NW corner to Friendship Long Island shoreline at MLW	~225' to the west



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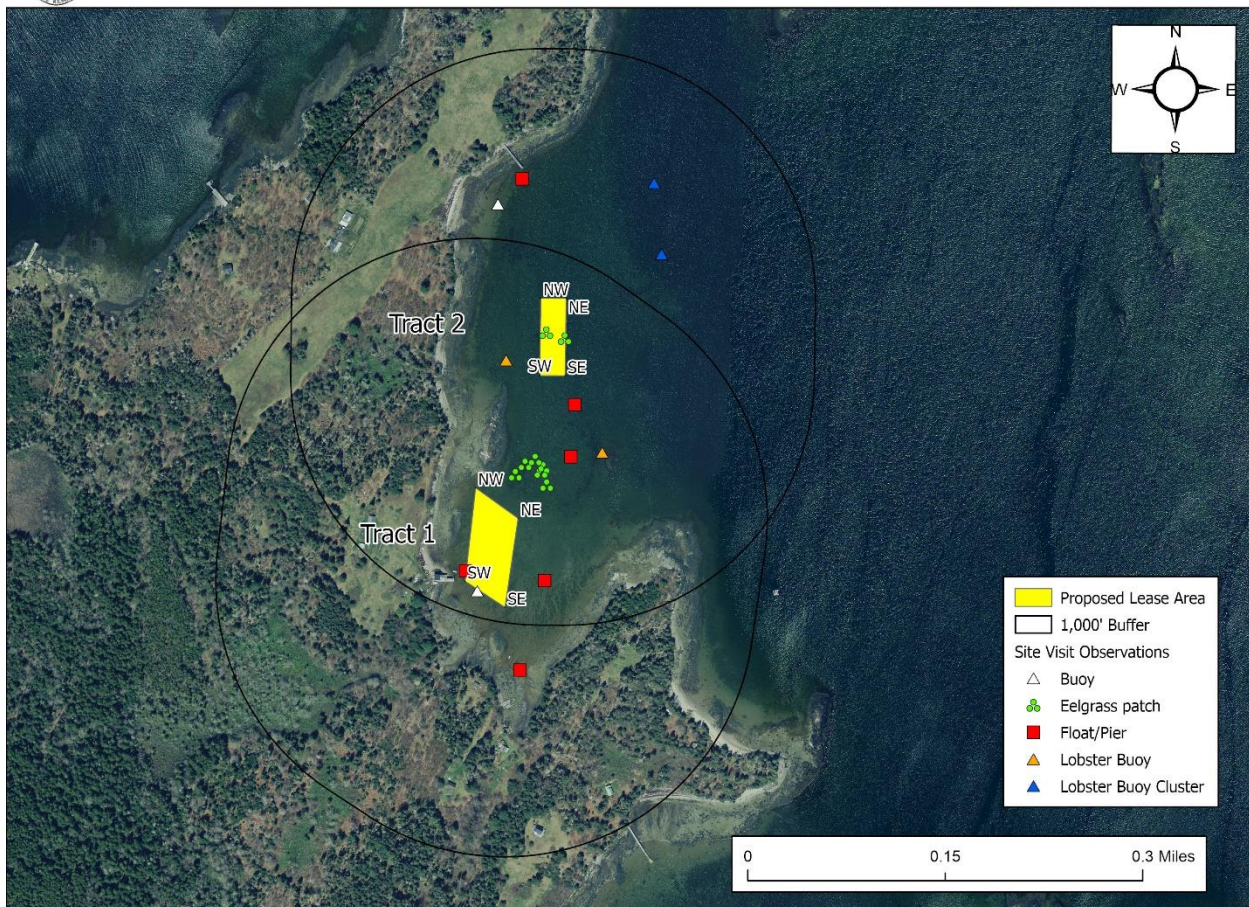


Figure 2. Proposed lease area with site visit observations.



Maine Department of Marine Resources Site Report

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Pursuant to statute and regulation, aquaculture leases are evaluated in consideration of applicable decision criteria. The site report documents MDMR's observations of the area and other information, in consideration of those criteria, as noted below:

(1) Riparian Ingress and Egress

MDMR scientists observed six floats/piers in the vicinity of the proposal. One dock located approximately 2 feet to the west of Tract 1 belongs to the applicant. A second dock, with an associated house, was approximately 258 feet southeast of Tract 1. Additionally, there was an empty float approximately 140 feet east of the eastern boundary of Tract 1. According to the application, this float may belong to the applicant's neighbor and is used as a swim float during the summer months.⁶ Two work floats were observed between Tract 1 and Tract 2. Both floats had lobster fishing gear stored on them. Lastly, one dilapidated pier was observed approximately 484 feet north of Tract 2.

(2) Navigation

Tract 1 of the proposal is located approximately 30 feet east of Friendship Long Island at MLW. Tract 2 is located approximately 120 feet east of Friendship Long Island at MLW. The main navigational channel is approximately 500 feet east of Tract 2. Red navigational buoy "6" is approximately 910 feet northwest of Tract 2 (Figure 3).

During MDMR's site visit on August 14, 2023, 45 total vessels were observed navigating within the vicinity of the proposal. MDMR scientists observed 20 recreational powerboats, 15 commercial fishing vessels, two sailboats, and two personal watercraft navigating in the main channel to or from Friendship Harbor. Four commercial fishing vessels were observed actively hauling lobster gear in the general vicinity of the proposal. Two kayakers were paddling into the cove where the proposal is located.

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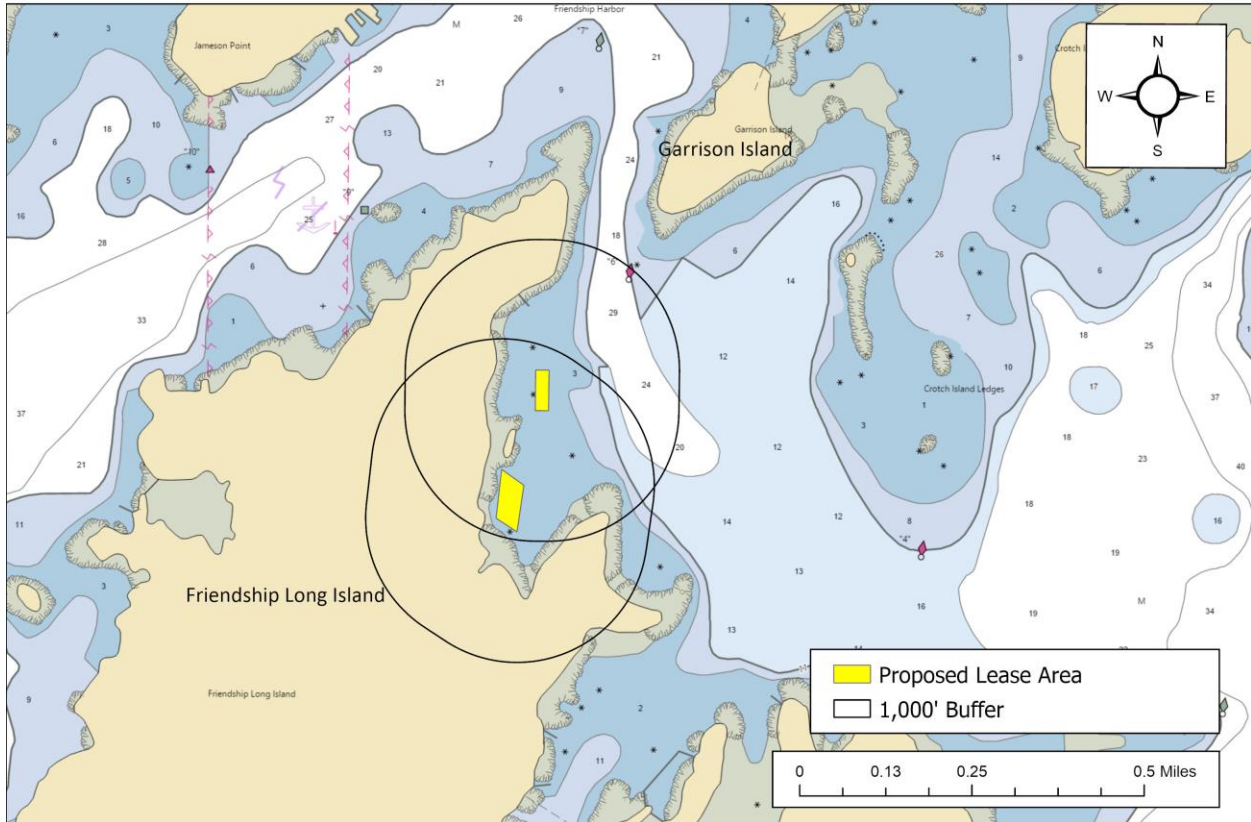


Figure 3. Navigational channels in the vicinity of the proposal.

(3) Fishing and Other Uses

During the site visit, MDMR documented two lobster buoys in the vicinity of the proposal. Additionally, there was light lobstering activity northeast of the proposal within and around the main navigational channel, as denoted “lobster buoy cluster” in Figure 2. As noted in section 2 above, four commercial fishing vessels were observed actively hauling lobster gear in the general vicinity of the proposal. As mentioned in section 1, there were two work floats observed between Tract 1 and Tract 2. Both floats had lobster fishing gear stored on them.



(4) Other Aquaculture Uses

There are no aquaculture leases within 1,000 feet of the proposal. One active limited purpose aquaculture (LPA) license, JCUT121, is within 1,000 feet of the proposed lease site. JCUT121 is located within proposed Tract 2, is held by the applicant, and will be relinquished if the proposal is granted⁷ (Figure 4).

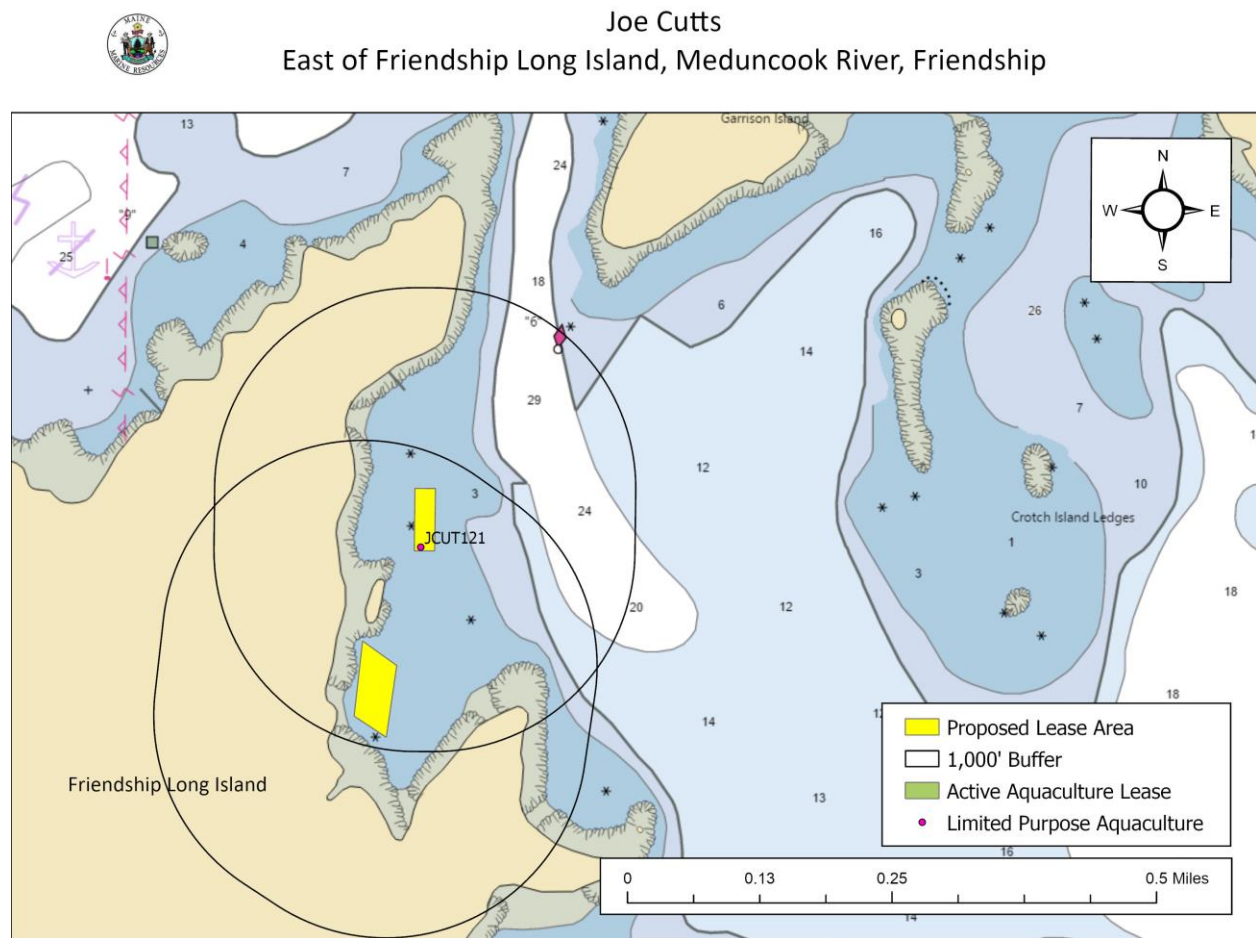


Figure 4. Aquaculture leases and LPA licenses in the vicinity of the proposed lease area.

(5) Existing System Support

Epibenthic Flora and Fauna

MDMR scientists utilized an ROV and snorkel transects to assess the epibenthic ecology of the proposed lease. The relative abundance of epibenthic flora and fauna observed are described below in Table 4.

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Table 4. Species observed using underwater camera footage and snorkel transects.

Species Observed	Abundance
Hermit Crab (<i>Paguridae</i> sp.)	Abundant
Crab (<i>Cancer</i> sp.)	Common
Hard Clam (<i>Mercenaria mercenaria</i>)	Common
Eelgrass (<i>Zostera marina</i>)	Occasional
Seaweed (<i>Ascophyllum</i> sp.)	Occasional
Atlantic Razor Clams (<i>Ensis directus</i>)	Occasional
Green Crab (<i>Carcinus maenas</i>)	Occasional
American/eastern Oyster (<i>Crassostrea virginica</i>)	Occasional
Common Periwinkle (<i>Littorina littorea</i>)	Occasional

Eelgrass (*Zostera marina*)

Historical records of eelgrass collected by MDMR in 2010 indicate mapped eelgrass presence within the proposal boundaries of Tract 2, and between Tract 1 and Tract 2 (Figure 5).⁸ During the site visits, MDMR scientists confirmed the presence of rooted eelgrass both within the vicinity of the proposal, and within the proposal boundaries of Tract 2. MDMR observed several patches of eelgrass approximately 130 feet north of the northern boundary of Tract 1. MDMR documented six eelgrass patches in this general area (Figure 2 and Image 1). Additionally, MDMR scientists observed several small eelgrass patches within the boundaries of Tract 2. The eelgrass patches appeared to be localized surrounding a very large, subtidal boulder (Image 2). MDMR documented two patches in this general area, as depicted in Figure 2.

⁸ Data obtained from The Maine Office of GIS "GISVIEW.MEDMR.Eelgrass". This was the most current record of mapped eelgrass within the vicinity of the proposal at the time the site report was written.



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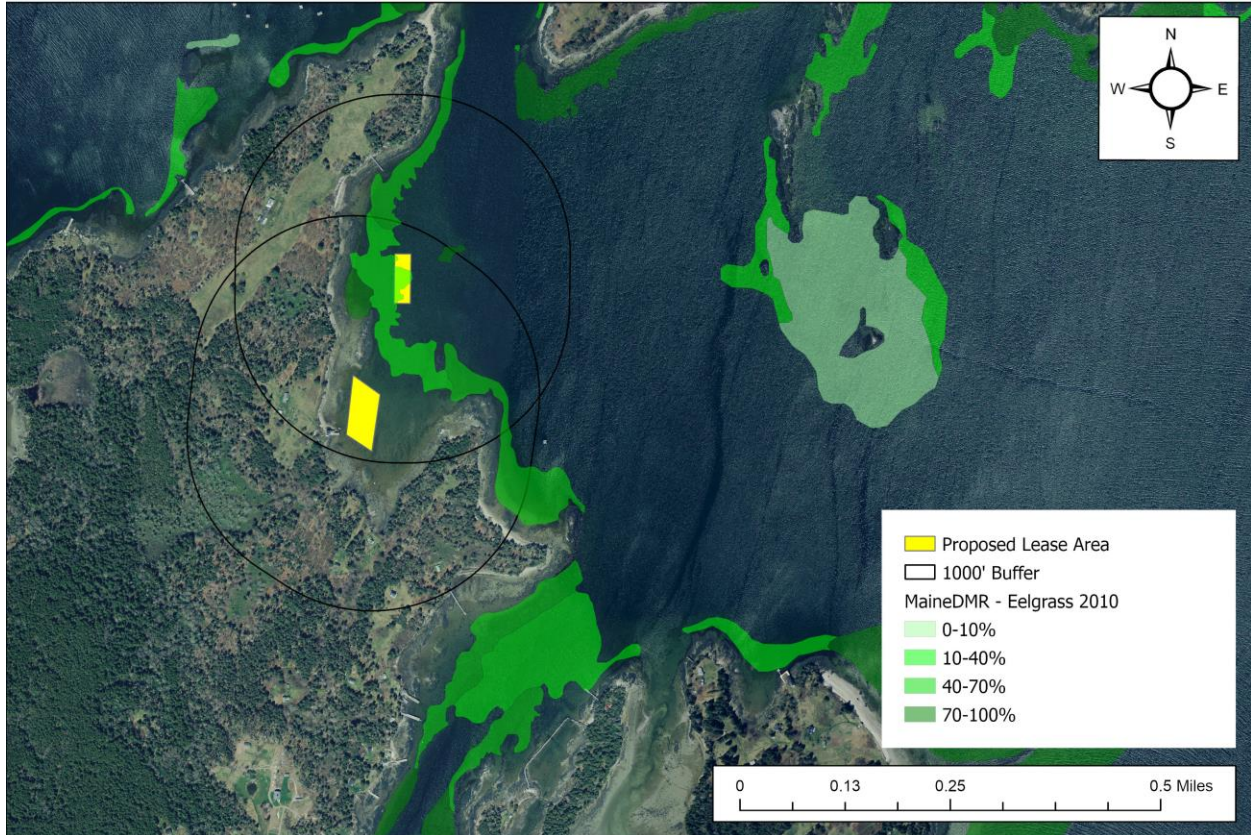


Figure 5. Mapped eelgrass (*Z. marina*) in the vicinity of the proposed lease area.

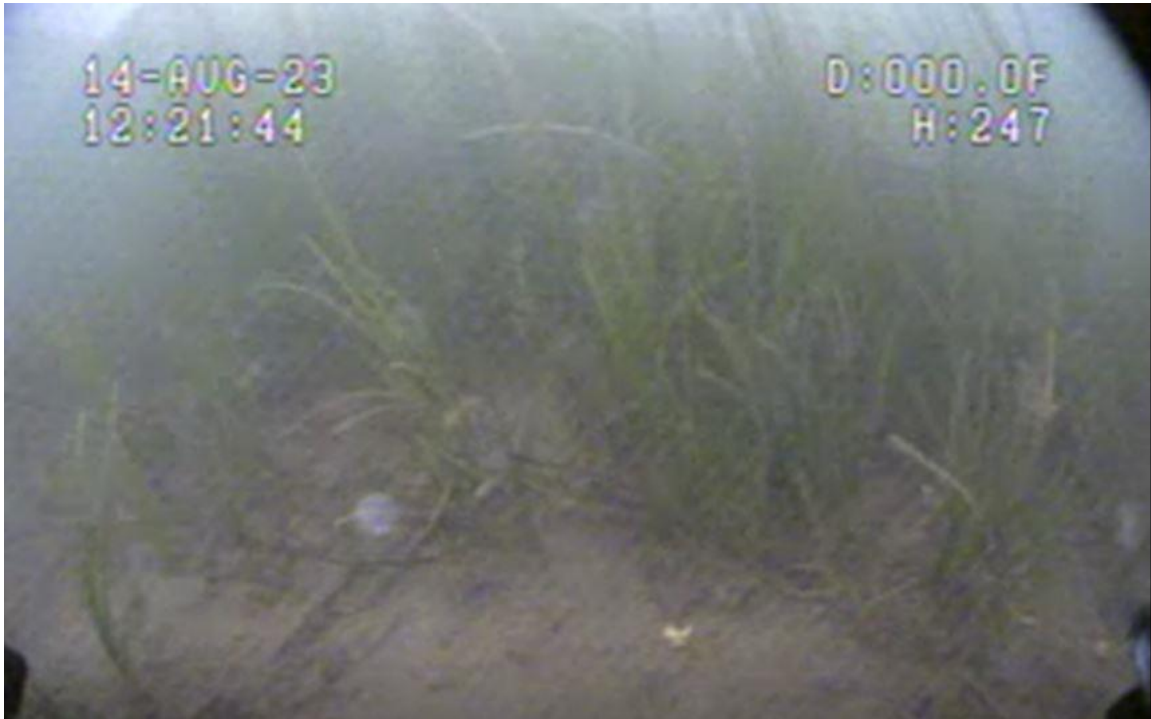


Image 1. Observed eelgrass located between proposed Tract 1 and proposed Tract 2.



Image 2. Observed eelgrass located within proposed Tract 2.



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Wildlife

According to Geographic Information System (GIS) data maintained by the Maine Department of Inland Fisheries and Wildlife (MDIFW) and available through the Maine Office of GIS (MEGIS), the proposed lease is located within mapped tidal waterfowl and wading bird habitat (Figure 6). Data collected by the United States Fish and Wildlife Service in 2022 by aerial nest survey shows the closest mapped bald eagle nesting site to be approximately 0.9 miles southeast of the proposal.⁹

On December 21, 2022, a Wildlife Biologist with MDIFW responded by email to a “Request for Agency Review and Comment” stating minimal impacts to wildlife are anticipated for this project.¹⁰

During the site visits, MDMR observed bald eagle (*Haliaeetus leucocephalus*), double-crested cormorants (*Nannopterum auritum*), osprey (*Pandion haliaetus*), laughing gull (*Leucophaeus atricilla*), herring gull (*Larus argentatus*), bonapartes gull (*Chroicocephalus philadelphia*), river otter (*Lontra canadensis*), common tern (*Sterna hirundo*), plover (*Charadrius sp.*), great blue heron (*Ardea herodias*), and king fisher (*Megaceryle sp.*) in the general vicinity of the proposal.

⁹ Data obtained from USFWS “Bald_Eagle_Nests_-_Maine_2023”.

¹⁰ Email correspondence between MDIFW and MDMR

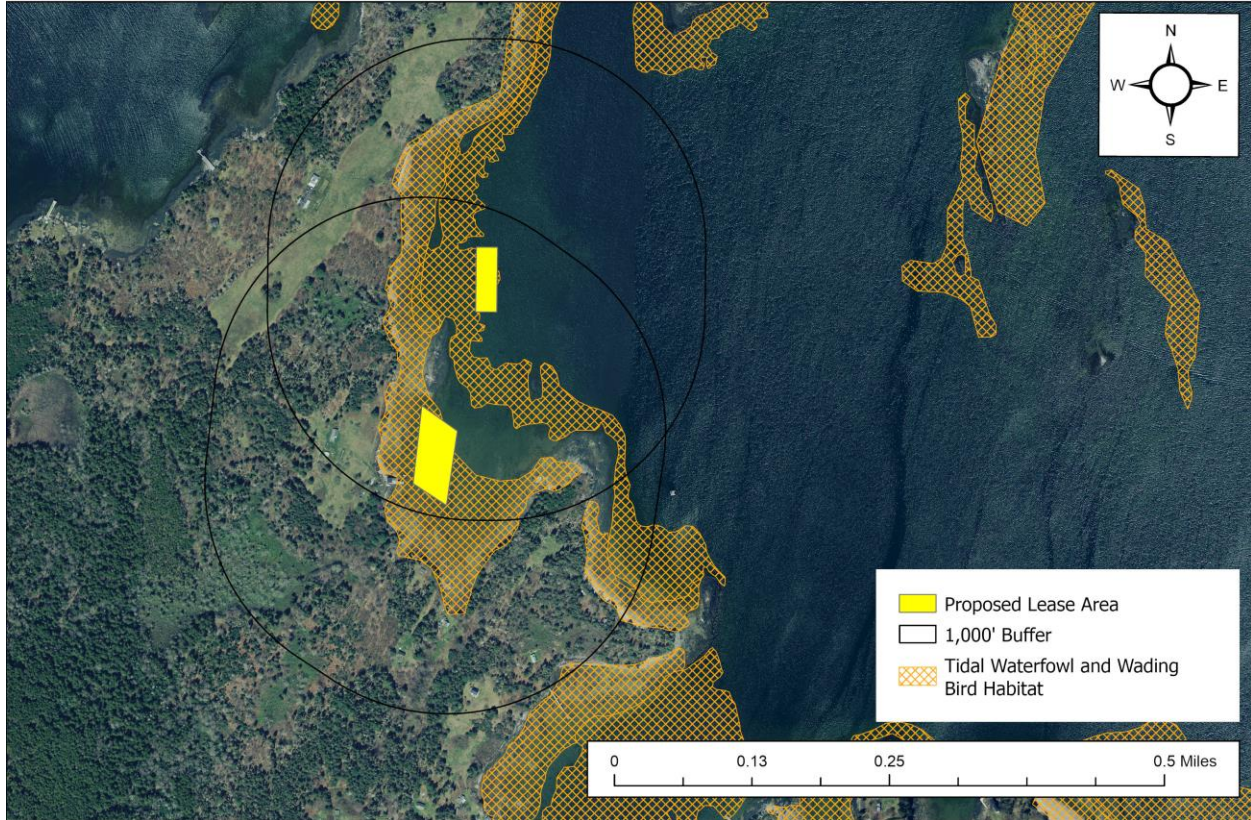


Figure 6. Mapped tidal waterfowl and wading bird habitat.¹¹

(6) Interference with Public Facilities

The proposed lease is not within 1,000 feet of any beach, park, or docking facility owned by federal, state, or municipal governments.

(7) Water Quality

The proposed lease is currently located within an area classified as Approved by the MDMR Bureau of Public Health.

¹¹ Data obtained from MDIFW maintained SDE Feature Class "GISVIEW.MEIFW.Twwh"