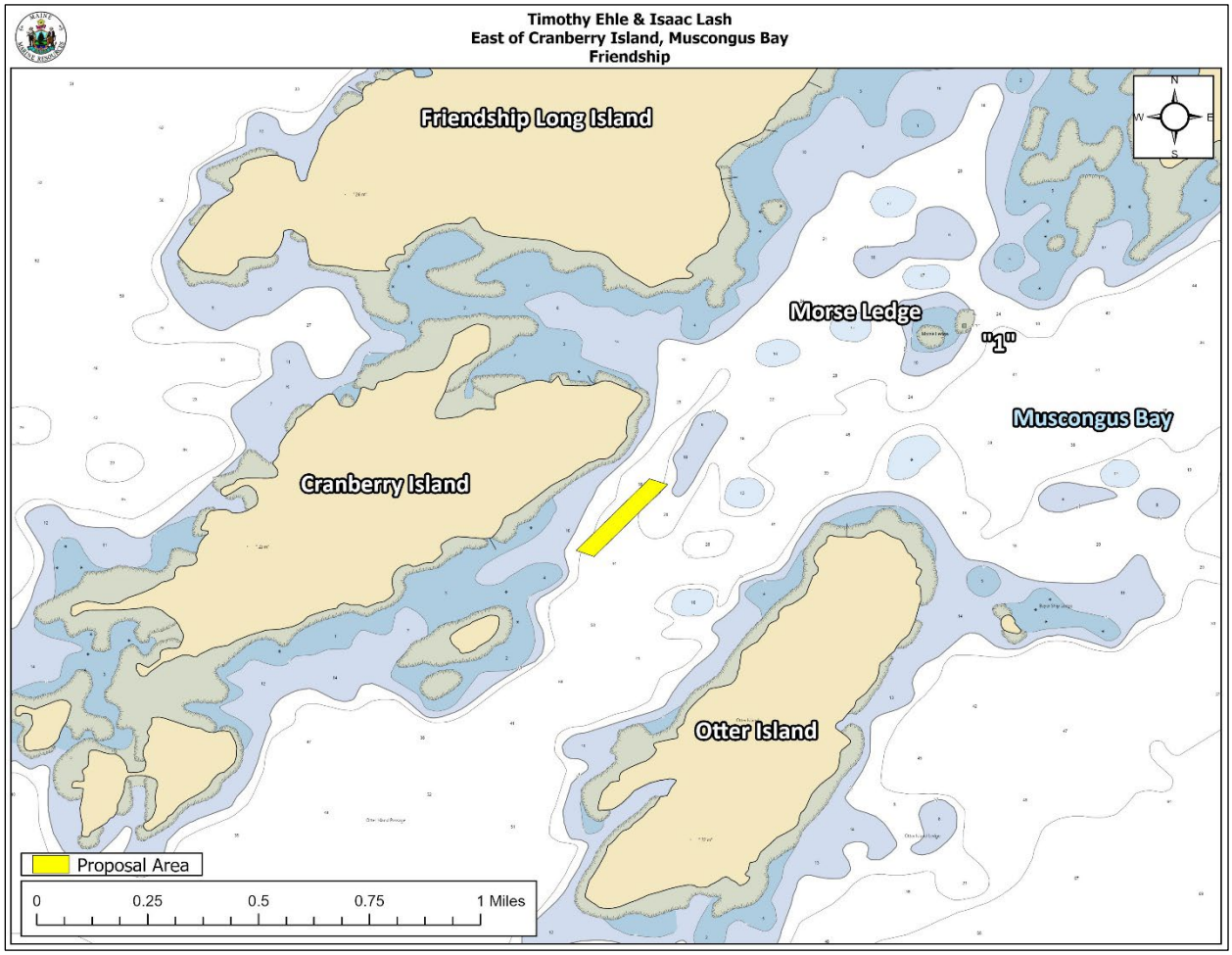

Figure 1. Vicinity map.[1]

Location: East of Cranberry Island, Muscongus Bay, Friendship, Knox County, Maine

Purpose: Standard lease for suspended culture of Alaria (*Alaria esculenta*), sugar kelp (*Saccharina latissima*), and dulse (*Palmaria palmata*).

Site Review: Geoffrey Shook and Katie Von Hohenleiten
Report Preparation: Geoffrey Shook and Meryl Grady

[1] Unless otherwise noted, all figures in this report were created in ArcGIS Pro version 3.3 using digitized NOAA Nautical Charts or geo-referenced aerial photographs provided by Esri (Firefly).

Application Overview

The applicants, Timothy Ehle & Isaac Lash, are requesting a 4.04[2]-acre, 20-year, standard lease east of Cranberry Island in Muscongus Bay for the suspended culture of marine algae. The applicants intend for the site to be active from November- April. During the "off-season" [May - October] all gear would be removed and stored on land.[3] The applicants currently operate experimental lease MUS ECIx in the immediate vicinity of the proposal. This proposal is intended to replace experimental lease MUS ECIx.[4]

General Characteristics

On July 16, 2025, Department of Marine Resources (DMR) scientists visited the proposed lease site. DMR scientists arrived on site at approximately 11:34 AM. The proposal is located in subtidal waters in Muscongus Bay approximately 345 feet to the east of Cranberry Island at mean low water (MLW) (Figure 3). The shoreline in the surrounding area was observed to be rocky with intermittent sandy beaches and marsh grass that led to mixed forest uplands and maintained residential properties.

Depth

On July 16, 2025, DMR scientists began collecting depths at the proposed site at approximately 11:35 AM. The tide was flooding with the next high tide predicted at 3:42 PM (Table 1). Depths were determined to be between 29.3-43.3 feet at the proposal corners. Correcting for tidal variations derives depths at mean low water (MLW, 0.0 feet) to be between 27.0-41.0 feet at the proposal corners. Approximate depths at mean high water (MHW, 9.0 feet[5]) are between 36.0-50.0 feet at the proposal corners (Table 2). Water current was flowing to the north-northwest at the time of the site visit.

Table 1. Predicted tidal heights in the Friendship, Maine.[6]

Date	Time	Height (ft)
2025/07/16	03:06 AM	9.8 H
2025/07/16	09:30 AM	-0.2 L
2025/07/16	03:42 PM	9.7 H
2025/07/16	09:57 PM	0.4 L

Table 2. Collected and derived depths at corners of the proposed lease area.

Corner	Measured Depth (ft)	MLW Depth (ft)	MHW Depth (ft)
NW	43.3	41.0	50.0
NE	30.0	27.7	36.7
SE	39.5	37.2	46.2
SW	29.3	27.0	36.0

[2] Applicant originally requested 4.05 acres. DMR calculations indicate the area is 4.04 acres.
[3] Application page 4, 8
[4] Application page 11
[5] MHW in Thomaston, ME is 9.0 feet, NOAA Tide Station 8415709
[6] https://www.usharbors.com/harbor/maine/friendship-harbor-me/tides/?tide=2025-7#monthly-tide-chart

Bottom Characteristics

DMR scientists observed the bottom characteristics of the proposed lease site via a remotely operated vehicle (ROV). Bottom characteristics were categorized using the Coastal and Marine Ecological Classification Standard (CMECS), a national standard for describing features of the marine environment (Table 3). Sediment information was determined based on visual analysis of the video. The bottom of the proposed lease site is primarily composed of mud with areas of sheet algal bed.

Table 3. Bottom characteristics of the proposed site.

Substrate Origin	Substrate Class	Substrate Subclass	Substrate Group
Geologic Substrate	Unconsolidated Mineral Substrate	Fine Unconsolidated Substrate	Mud
Benthic/Attached Biota	Aquatic Vegetation Bed	Benthic Macroalgae	Sheet Algal Bed

Position and Distances to Shore

The geodesic measuring tool in ArcGIS Pro 3.3 was used to verify the distances and bearings between proposed lease corners. Distances to shore were determined using the measuring tool in ArcGIS Pro 3.3, a nautical chart provided by the National Oceanic and Atmospheric Administration (NOAA), and the application coordinates (Table 4, Figure 2,3).

Application Coordinates (WGS84) – 4.04 Acres

Corner	Latitude	Longitude					
NW	43.93638°	-69.34930°	then	171	feet at	113°	True to
NE	43.93620°	-69.34870°	then	1,065	feet at	216°	True to
SE	43.93385°	-69.35110°	then	169	feet at	293°	True to
SW	43.93405°	-69.35168°	then	1,056	feet at	036°	True to NW

Table 4. Approximate distances from proposal corners to surrounding features (Figure 2,3).

Feature	Distance
NW corner to Cranberry Island at MLW	~345’ to the west
NW corner to green navigation aid “1”	~3,264’ to the northeast
NE corner to green navigation aid “1”	~3,168’ to the northeast
NE corner to Otter Island at MLW	~1,407’ to the east
SE corner to Otter Island at MLW	~1,605’ to the east
SE corner to Joes Island at MLW	~956’ to the south-southwest
SW corner to Joes Island at MLW	~901’ to the south-southwest
SW corner to Cranberry Island at MLW	~536’ to the west

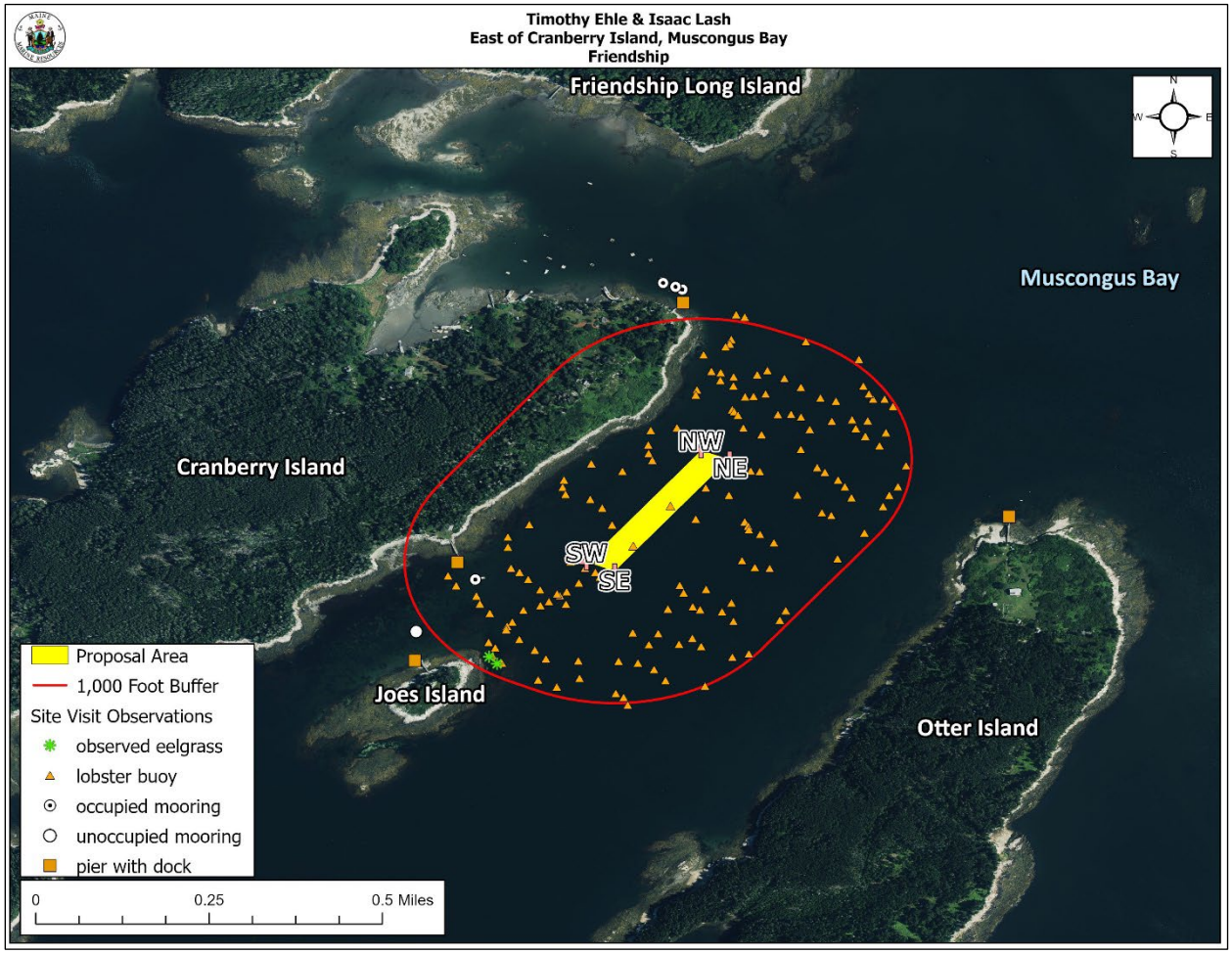

Figure 2. Proposed lease area with site visit observations.

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

(1) Riparian Ingress and Egress

During the site visit, DMR scientists observed residential properties on all the islands within the vicinity of the proposal. There were two piers with docks attached observed on Cranberry Island approximately 709 feet to the southwest and 1,125 feet to the northwest of the proposal. A pier with a dock attached was also observed on Joes Island approximately 1,204 feet to the south-southwest of the proposal. There was also a pier with a dock on the northern tip of Otter Island approximately 1,596 feet to the east of the proposal. During the site visit, scientists observed a mooring occupied with an approximate 45-foot lobster boat along the southern shore of Cranberry Island approximately 626 feet to the southwest of the proposal, as well as an unoccupied mooring along the northern shore of Joes Island approximately 1,075 feet to the

southwest of the proposal. A mooring field was also observed along the northern shore of Cranberry Island. Three moorings from the mooring field closest to the proposal were located approximately 1,226 feet, 1,250 feet, and 1,288 feet to the northwest of the proposal (Figure 2). At the time of the site visit, there was an approximate 31-foot sailboat attached to one of the moorings and an approximate 5-foot dinghy style boat on each of the other two observed moorings.

A Municipal Questionnaire was received by DMR from the Town of Friendship on March 7, 2025. The response stated there are no permitted moorings nearby or within the boundaries of the proposal. It was indicated that there is a dock approximately 300 feet from the proposal that is accessed by 38 to 40-foot-long fishing vessels.

(2) Navigation

The proposal is located in Muscongus Bay approximately 345 feet to the east of Cranberry Island at MLW. There is approximately 1,407 feet of navigable water at MLW between the proposal and Otter Island to the east. The proposal is not within any marked navigational routes. Navigational routes in the area are primarily to the east of Otter Island and to the west of Cranberry Island (Figure 3).

During the site visit, DMR scientists observed a menhaden fishing boat and two lobster boats transiting to the east of the proposal between the proposal and Otter Island, as well as one lobster boat and one sailboat transiting to the west of the proposal between the proposal and Cranberry Island. There was also one jet-ski observed transiting through the proposal area two times.

The Municipal Questionnaire stated that there is commercial vessel navigation in the vicinity of the proposal. It was indicated that 30-40 lobster boats may navigate through the area on a busy day. The typical direction of travel indicated is south/southeast to north/northwest. The Municipal Questionnaire also indicated that there is not significant recreational boating traffic in the area.

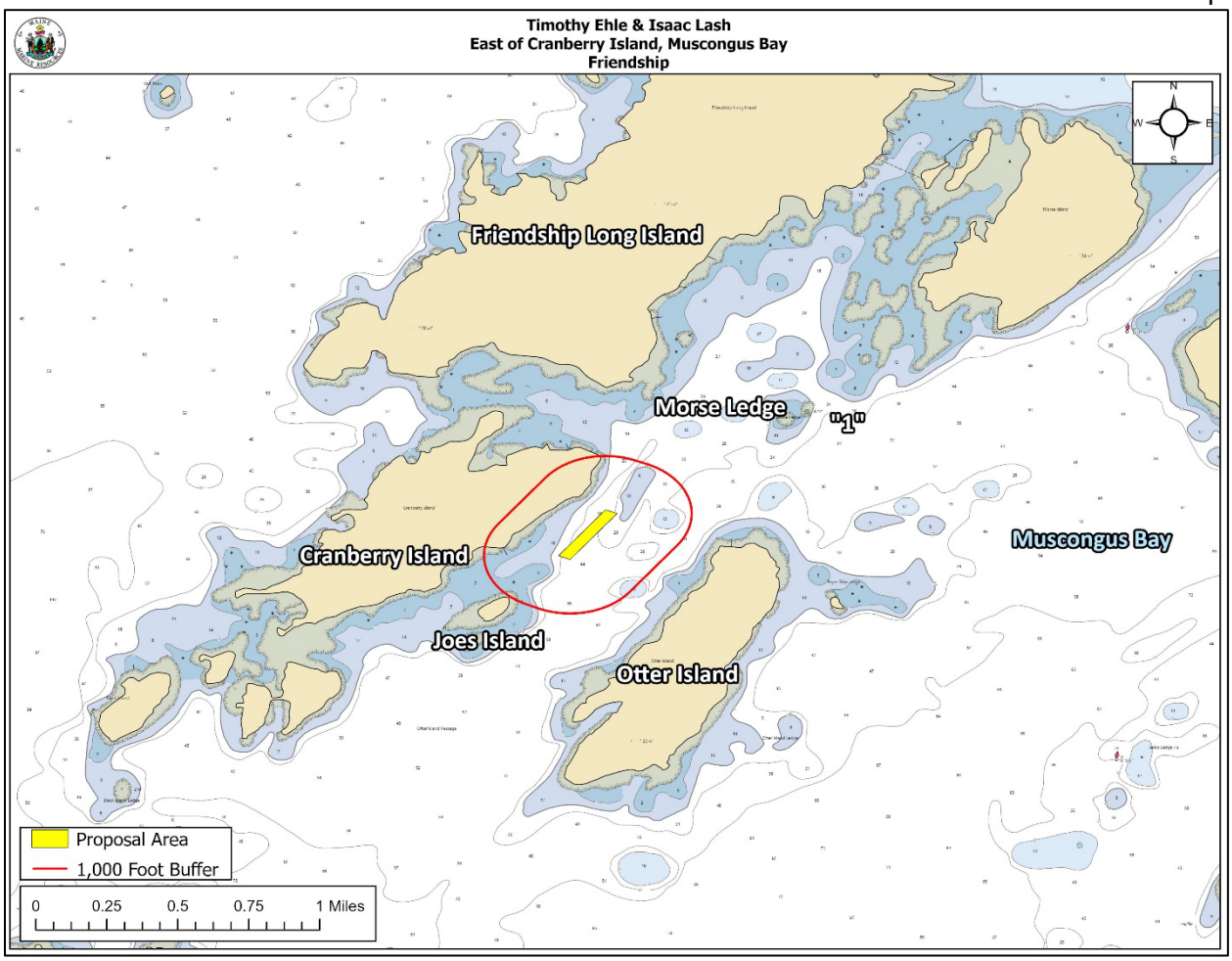

Figure 3. Navigational channels in the vicinity of the proposed lease area.

(3) Fishing and Other Uses

During DMR's site visit, scientists observed 155 lobster buoys within the vicinity of the proposal, with the closest located within the proposal boundaries (Figure 2). Scientists also observed a lobster boat actively tending traps throughout the area within 1,000 feet of the proposal.

The Municipal Questionnaire stated that there is no commercial or recreational fishing within the area of the proposal. The Municipal Questionnaire also indicated that there may be kayaking, swimming, and other recreational activities that occur in the area around the proposal, but those activities would not be occurring during the time of year the proposed lease would be active.

(4) Other Aquaculture Uses

There are not any active limited purpose aquaculture (LPA) sites located within the vicinity of the proposal. There is one experimental aquaculture lease (MUS ECIx) within 1,000' of the proposal. The proposal area and MUS ECIx partially overlap. The proposal area is located approximately 413 feet further southeast than MUS ECIx (Figure 4). MUS ECIx is operated by the applicants of this proposal, and this proposal would replace MUS ECIx, if granted. During the site visit, DMR scientists did not observe any buoys or gear related to aquaculture within the vicinity of the proposal.

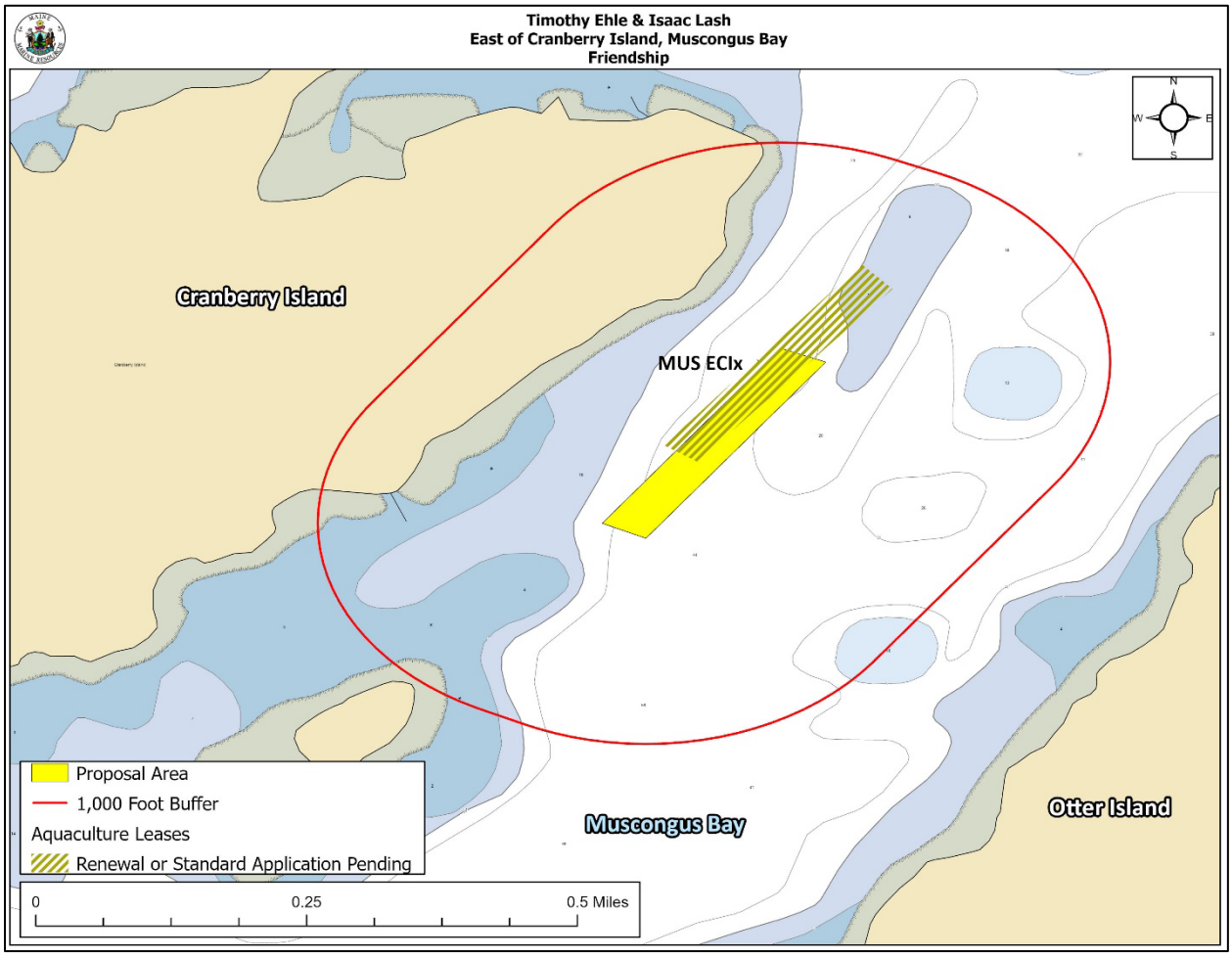

Figure 4. Aquaculture leases and LPA licenses in the vicinity of the proposed lease area.

(5) Existing System Support

Epibenthic Flora and Fauna

DMR scientists utilized an ROV to assess the epibenthic ecology of the proposed lease. The relative abundance of epibenthic flora and fauna observed in the video footage is described below in Table 5.

Table 5. Species observed on underwater video footage.

Species Observed	Abundance
Rockweed (*Ascophyllum nodosum*)	Occasional
Siphoned feather weed (*Dasysiphonia japonica*)	Occasional
Sugar kelp (*Laminaria digitata*)	Rare
Cancer crab (*Cancer* sp.)	Rare
American lobster (*Homarus americanus*)	Rare

Eelgrass (*Zostera marina*)

Records of seagrass collected by the Department of Environmental Protection (DEP) in 2023[7] indicate there is eelgrass mapped within 1,000 feet of the proposal. The nearest mapped eelgrass is approximately 301 feet west of the proposal (Figure 5).

During DMR's site visit, scientists did not observe any eelgrass on underwater video footage within the boundaries of the proposal. Eelgrass was observed attached to the seafloor within the vicinity of the proposal. Eelgrass was observed to the north of Joes Island approximately 898-917 feet southwest of the proposal (Figure 2). Observed eelgrass was moderate in density and appeared healthy (Image 1).

[7]Data obtained from The Maine Office of GIS "GISVIEW.MEDEP.Seagrass2023". Widgeon grass was observed only in a tributary to the Great Salt Bay, upstream of a culvert that likely restricts tidal flow. Eelgrass was the dominant vascular species in all other locations. This is the most current record of mapped eelgrass within the vicinity of the proposal.

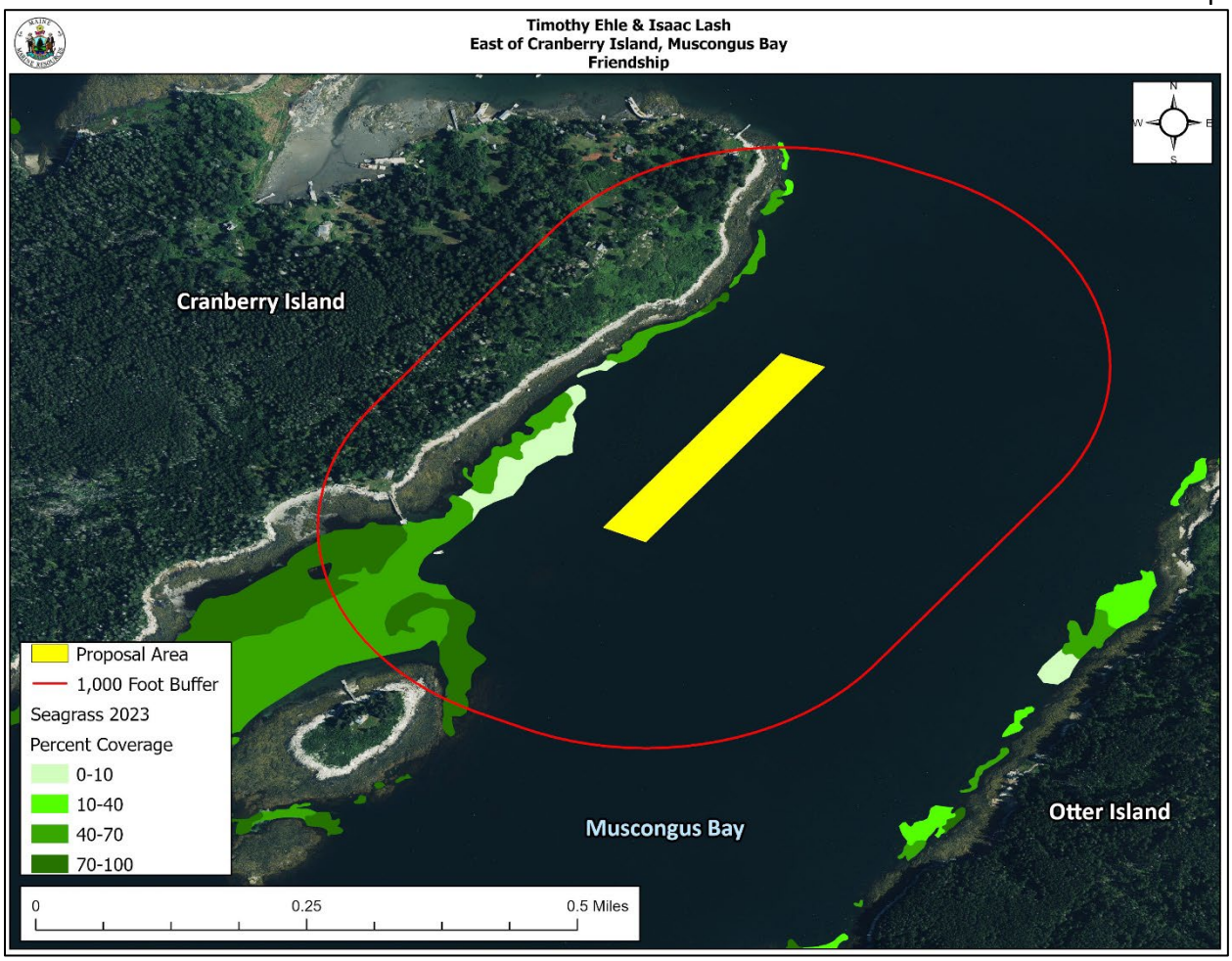

Figure 5. Mapped eelgrass (*Z. marina*) in the vicinity of the proposed lease area.

Image 1. Eelgrass observed within the vicinity of the proposal.

Wildlife

During the site visit, DMR scientists observed menhaden (*Brevoortia tyrannus*), herring gulls (*Larus argentatus*), black guillemots (*Cepphus grylle*), harbor porpoises (*Phocoena phocoena*), a harbor seal (*Phoca vitulina*), mallard ducks (*Anas platyrhynchos*), lion's mane jellyfish (*Cyanea capillata*), and great cormorants (*Phalacrocorax carbo*) in the general vicinity of the proposal. The harbor seal was observed swimming in the vicinity of the proposal.

The Department of Inland Fisheries and Wildlife (IFW) has jurisdiction over inland fisheries and wildlife resources of the State. IFW also has the authority to conserve wildlife populations and their ecosystems through applicable state laws and rules. DMR provides IFW with notice and the opportunity to comment on all complete lease applications. In addition, the Site Report also includes IFW designated and mapped habitat types that are within 1,000 feet of the lease proposal, if applicable.

According to Geographic Information System (GIS) data maintained by IFW and available through the Maine Office of GIS (MEGIS), there is one mapped habitat type within 1,000 feet of the lease proposal. Measuring from the SW corner, the proposal is located approximately 309 feet to the east of mapped Tidal Waterfowl and Wading Bird Habitat (TWWH) (Figure 6).

Though bald eagles are no longer listed on Maine's Endangered and Threatened Species List, the United States Fish and Wildlife Service (USFWS) may also have jurisdiction over the management and conservation of the species based on applicable law and rule. Data collected by USFWS in 2023 by aerial nest survey shows there is no mapped bald eagle nesting site within the vicinity of the proposal. The nearest bald eagle nest is mapped approximately 1.7 miles to the northeast of the proposal.

IFW was provided with the opportunity to comment on this proposal. On March 3, 2025, a Resource Biologist with IFW responded by email to a "Request for Agency Review and Comment" stating that the proposal is not located within any IFW jurisdictional resources and minimal impacts are anticipated.[8]

[8] Email correspondence between IFW and DMR

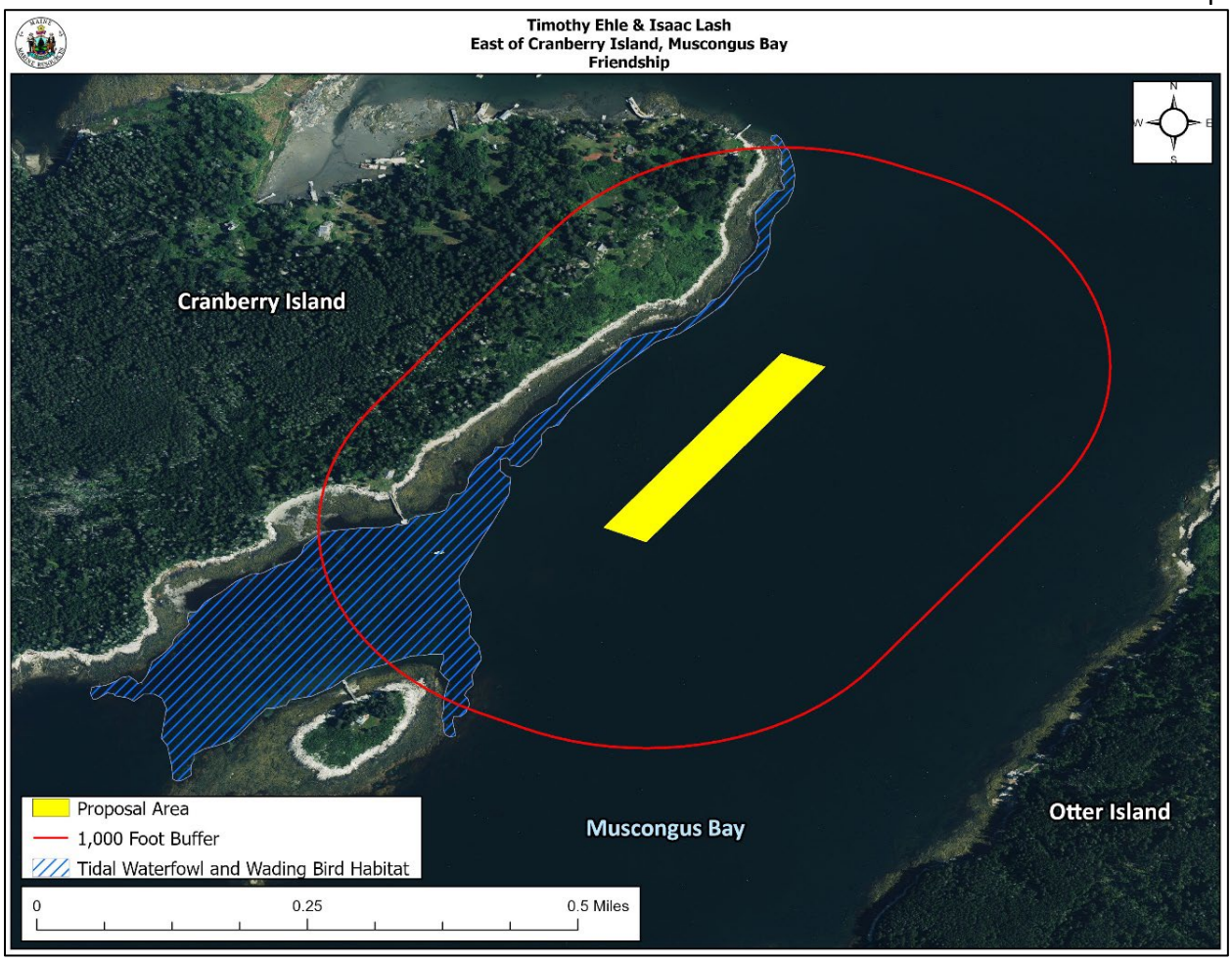

Figure 6. Mapped wildlife habitats in the vicinity of the proposed lease area. [9]

[9] Data obtained from USFWS "Bald_Eagle_Nests_-_Maine_2023" and IFW "EHRTERN", "EHPLVTRN", "GISVIEW.MEIFW.Twwh", "ShorebirdAreas", and "SNI".

(6) Interference with Public Facilities

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

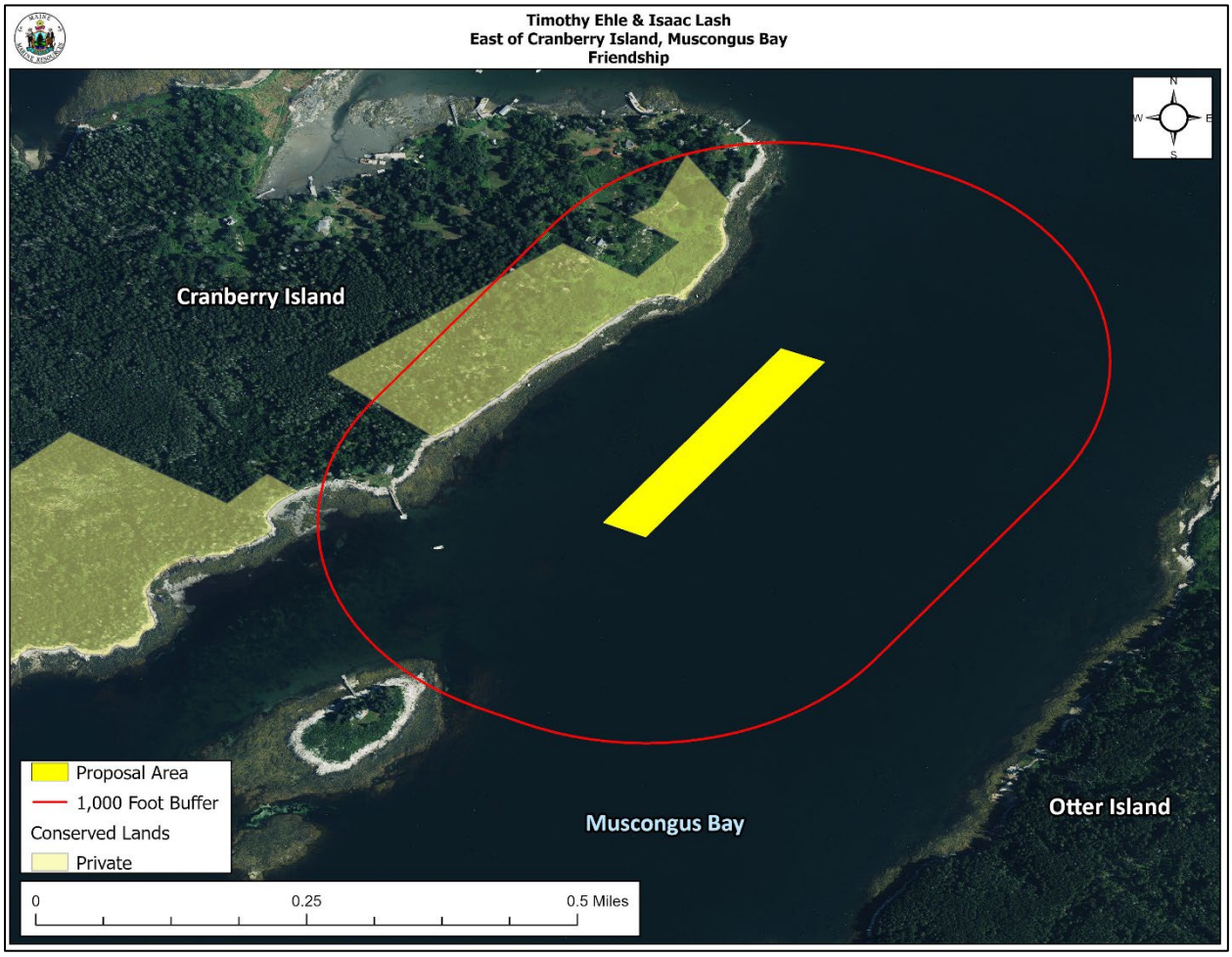

Figure 7. Public facilities near the proposed lease site.[10]

(7) Water Quality

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

[10] Data obtained from The Maine Office of GIS "GISVIEW.MECONSLANDS.Conserved_Lands"