

Figure 1. Vicinity map.¹

Location: West of Middle Island, Penobscot Bay, Islesboro, Waldo County, Maine

Purpose: Experimental lease for suspended culture of sugar kelp (*Saccharina latissima*), skinny kelp (*Saccharina angustissima*), winged kelp (*Alaria esculenta*), horsetail/fingered kelp (*Laminaria digitata*), Dulse (*Palmaria palmata*), and sea lettuce (*Ulva lactuca*).

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



Application Overview

The applicant, Lake Lindelof, is requesting a 3.98² acre experimental lease west of Middle Island in Penobscot Bay for the suspended culture of marine algae. The applicant intends to remove all gear except corner markers, mooring blocks, mooring chain, four mooring lines, and four mooring balls from June 15th through October 15th.³

General Characteristics

On September 28, 2023, Maine Department of Marine Resources (MDMR) scientists assessed the proposed lease site. MDMR scientists arrived on site at approximately 11:04 AM. The western shore of Middle Island, in the vicinity of the proposal, consists of rocky coastline leading to forested uplands and is undeveloped.

Depth

MDMR scientists began collecting depths at the proposed site during a falling tide at approximately 11:04 AM. Measured depths at corners of the proposed lease site ranged from 44.5 to 49.2 feet. Correcting for tidal variation derives water depths at the corners of the proposal at mean low water (MLW, 0.0 feet) to be from 34.3 to 39.0 feet (Table 1).

Table 1. Predicted tidal heights in Tenants Harbor, Maine.⁴

Date	Time	Height (ft)
2023/09/28	4:12 AM	-0.8 L
2023/09/28	10:26 AM	10.5 H
2023/09/28	4:31 PM	-0.7 L
2023/09/28	10:47 PM	11.3 H

Bottom Characteristics

MDMR 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 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

² Applicant originally requested 4.0 acres. MDMR calculations indicate the area is 3.98 acres.

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⁴ <https://www.usharbors.com/harbor/maine/tenants-harbor-me/tides/?tide=2023-09#monthly-tide-chart>



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) – 3.98 Acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>	
NW	44.23951°	-68.94034°	then 163.9 feet at 118° True to
NE	44.23931°	-68.93978°	then 1,057.4 feet at 208° True to
SE	44.23670°	-68.94154°	then 163.9 feet at 296° True to
SW	44.23690°	-68.94210°	then 1,057.4 feet at 026° True to NW

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

Feature	Distance
NE corner to Middle Island at MLW	~437' to the east
SE corner to Job Island at MLW	~394' to the east
SW corner to Haskell Ledge at MLW	~3,881' to the west
NW corner to southern shoreline of Seven Hundred Acre Island at MLW	~4,082' to the west

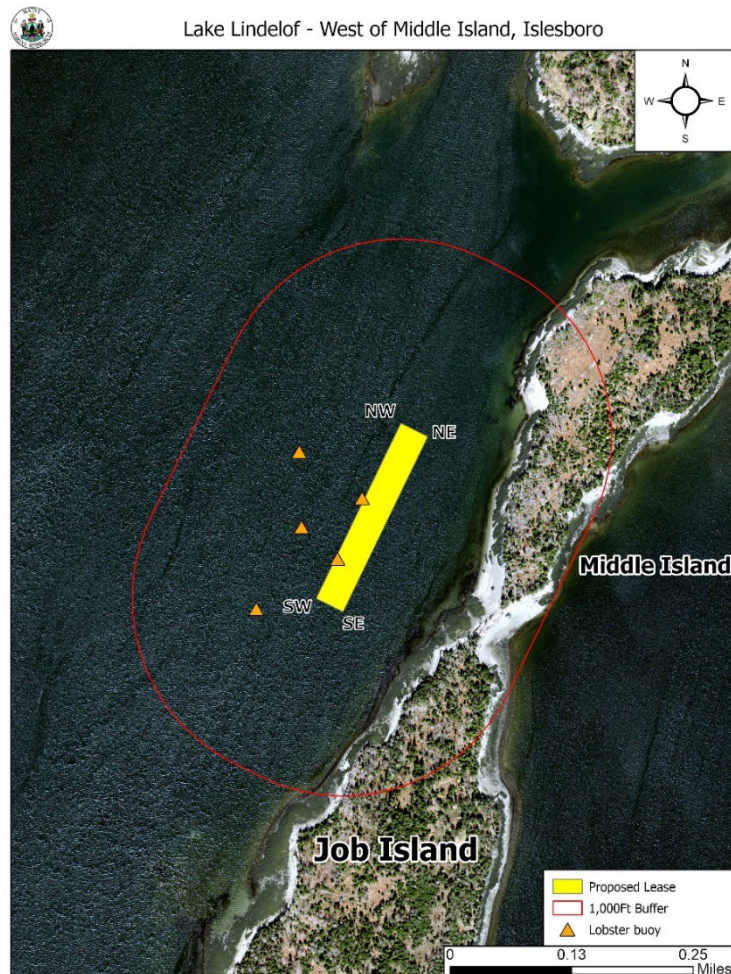


Figure 2. Proposed lease area with site visit observations.

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

(1) Riparian Ingress and Egress

MDMR did not observe any docks, houses, or moorings in the vicinity of the proposal. Nearby Job and Middle Islands, located to the east of the proposal, are uninhabited and no docks or other structures were observed at the time of the site visit.

(2) Navigation

The proposal is located approximately 394 feet to the west of Job Island at MLW. There is approximately 3,881 feet of navigable water between the proposal and the eastern shore of



Haskell Ledge at MLW. The proposal is approximately 1,900 feet east of the center of the nearest navigational channel. No vessel traffic was observed during the site visit.

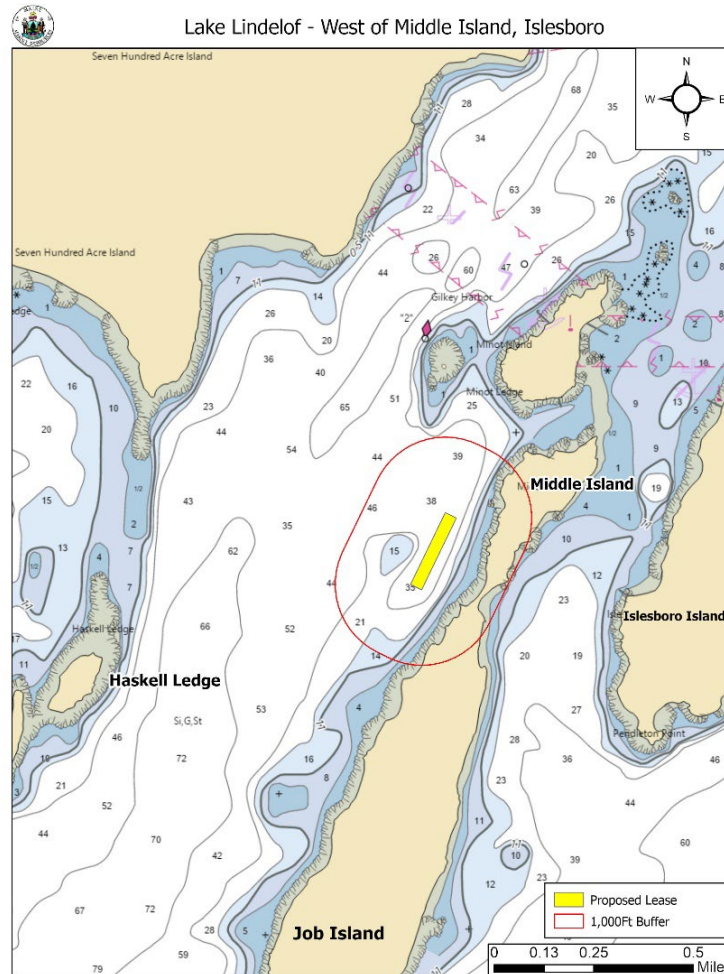


Figure 3. Navigational channels in the vicinity of the proposed lease area.

(3) Fishing and Other Uses

During the site visit, MDMR documented lobster buoys within the bounds of and in the general vicinity of the proposal. MDMR recorded the location of buoys closest to the proposal, as seen in Figure 2. One lobster buoy was located within the bounds of the proposed lease and another lobster buoy was nearby at approximately 14.8 feet west of the proposal boundaries. Three additional lobster buoys were observed in the vicinity of the proposed lease. During the MDMR site visit on September 28, 2023, there was moderate lobstering activity observed to the west of the proposal.



(4) Other Aquaculture Uses

There are no aquaculture leases within 1,000 feet of the proposed lease site. There is one limited purpose aquaculture (LPA) site (NZLO124) located 603.3 feet to the northwest of the proposed site (Figure 4).

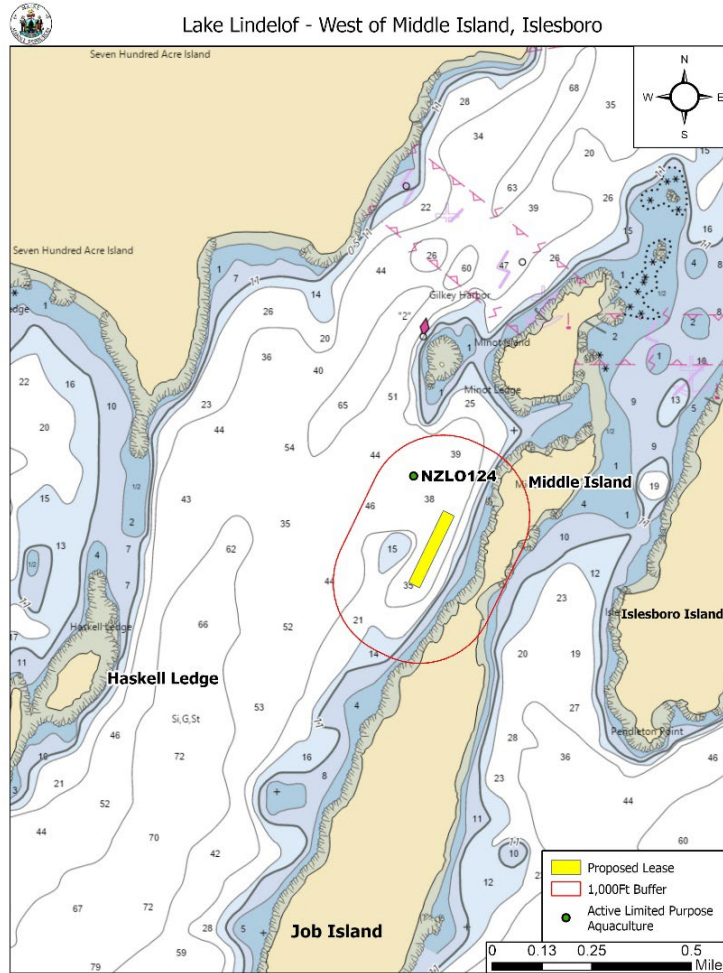


Figure 4. Aquaculture leases and LPA licenses in the vicinity of the proposed lease area.

(5) Existing System Support

Epibenthic Flora and Fauna

On September 28, 2023, MDMR 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 transect is described below in Table 4.

Table 4. Species observed on underwater camera footage.

Species Observed	Abundance
Shrimp (<i>Crangon septemspinosa</i>)	Common



Species Observed	Abundance
Crab (<i>Cancer</i> spp)	Common
Coral weed (<i>Corallina officinalis</i>)	Rare
Unidentifiable Fish	Rare

Eelgrass (*Zostera marina*)

Historical records of eelgrass collected by MDMR in 2010 indicate mapped eelgrass presence in the vicinity of the proposal. The nearest mapped eelgrass is approximately 346.3 feet east of the proposal (Figure 5).⁵ During MDMR’s site assessment, a small patch of eelgrass was observed on underwater camera footage within the proposal boundaries. The small patch of eelgrass was rooted to the seafloor and very sparse (Image 1). Water depth in this general area is approximately 34.3 to 39.0 feet at MLW.

Eelgrass is typically found in shallower water depths in subtidal to low intertidal areas to allow for adequate light penetration. MDMR expects seasonal regrowth of eelgrass to occur in April/May and seasonal senescence of eelgrass to occur in October/November. The applicant is proposing to seasonally culture marine algae on longlines from October/November to June.⁶

⁵ Data obtained from The Maine Office of GIS “GISVIEW.MEDMR.Eelgrass”. This is the most current record of mapped eelgrass within the vicinity of the proposal.

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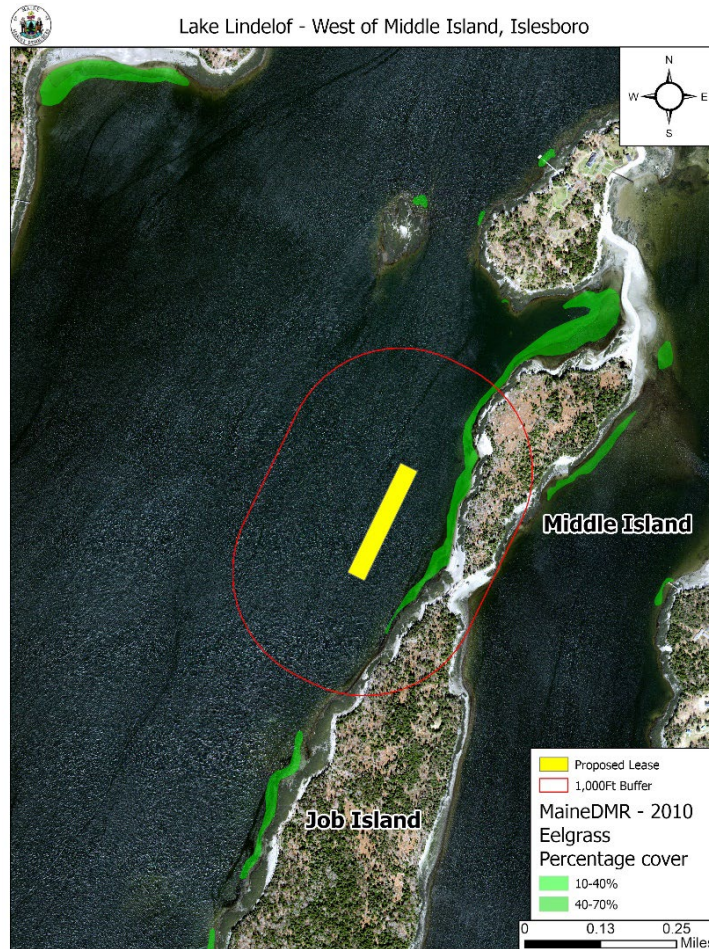


Figure 5. Mapped eelgrass (*Z. marina*) in the vicinity of the proposed lease area.

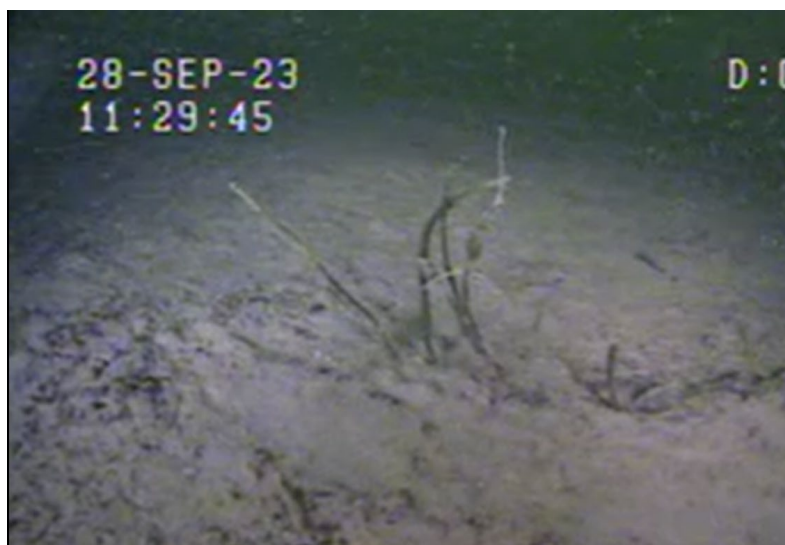


Image 1. Eelgrass (*Z. marina*) observed on underwater footage within the proposed lease area during the MDMR site assessment.



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 approximately 346.3 feet to the west of mapped Tidal Waterfowl and Wading Bird Habitat. Data collected by the United States Fish and Wildlife Service in 2023 by aerial nest survey shows the closest mapped bald eagle nesting site to be approximately 0.77 miles southwest of the proposal (Figure 6). A bald eagle (*Haliaeetus leucocephalus*) was also observed during the site assessment. During the site assessment, MDMR scientists observed common eiders (*Somateria mollissima*), black guillemots (*Cepphus grylle*), double-crested cormorants (*Nannopterum auritum*), common loons (*Gavia immer*), seals (Subfamily: *Phocidae*) and herring gulls (*Larus argentatus*) in the general vicinity of the proposal.

On June 22, 2023, 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.⁷



Figure 6. Mapped bald eagle nests and Tidal Waterfowl and Wading Bird Habitat.⁸

⁷ Email correspondence between MDIFW and MDMR

⁸ Data obtained from USFWS “Bald_Eagle_Nests_-_Maine_2023” and MDIFW maintained SDE Feature Class “GISVIEW.MEIFW.Twwh”



Maine Department of Marine Resources Site Report

Lake Lindelof
West of Middle Island, Penobscot Bay
Islesboro

(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 and Aquaculture.