



Colby Davidson (App 2)
East of Hog Island, Muscongus Bay, Bremen

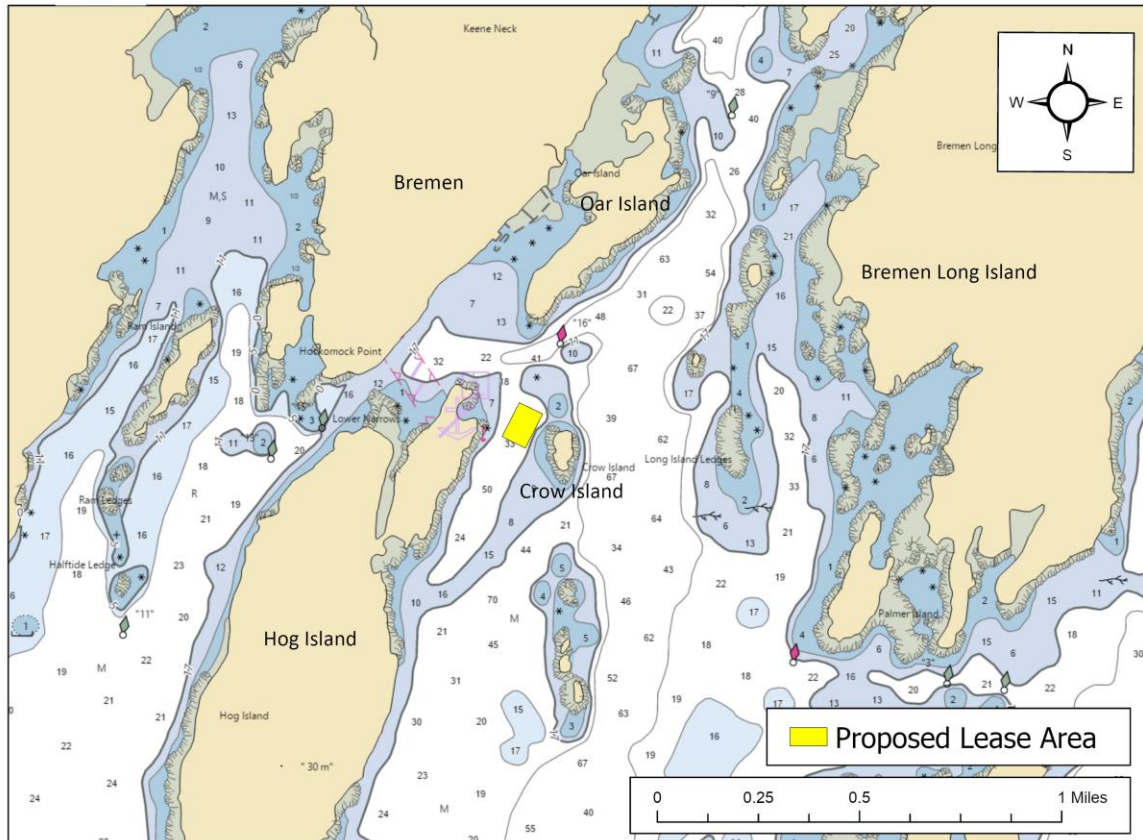


Figure 1. Vicinity map.¹

Location: East of Hog Island, Muscongus Bay, Bremen, Lincoln County, Maine

Purpose: Experimental lease for suspended culture of sugar kelp (*Saccharina latissima*) and skinny kelp (*Saccharina angustissima*).

Site Review: Geoffrey Shook and Molly Waters

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 geo-referenced aerial photographs provided by The Maine Office of GIS.



Application Overview

The applicant, Colby Davidson, is requesting 3.89 acres east of Hog Island in Muscongus Bay for the suspended culture of marine algae. The applicant intends to remove all gear, except corner markers, mooring blocks, and four mooring lines and balls, from June 1 through November 1.²

General Characteristics

On July 17, 2023, Maine Department of Marine Resources (MDMR) scientists assessed the proposed lease site beginning at 10:30 AM. The northeastern shore of Hog Island, in the vicinity of the proposal, consists of rocky coastline leading to coniferous uplands.

Depth

MDMR scientists began collecting depths at 10:30 AM at the proposed site, which was approximately 1.5 hours before high tide. Measured depths at corners of the proposed lease site ranged from 31.6 to 42.5 feet. Correcting for tidal variation derives water depths at the corners of the proposal at the next high tide to be from 32.7 to 43.6 feet and from 24.3 to 35.2 feet at mean low water (MLW, 0.0 feet) (Table 1).

Table 1. Predicted tidal heights in Muscongus Harbor, Maine.³

Date	Time	Height (ft)
2023/07/17	5:47 AM	0.1 L
2023/07/17	11:52 AM	8.4 H
2023/07/17	5:44 PM	1.4 L
2023/07/17	11:53 PM	9.8 H

Bottom Characteristics

MDMR scientists observed the bottom characteristics of the proposed lease site via drop camera 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 and shell rubble.

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
Biogenic Substrate	Shell Substrate	Shell Rubble	Clam/Oyster Rubble

² Application pages 4 and 5

³ <https://www.usharbors.com/harbor/maine/muscongus-harbor-me/>



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) – 3.89 Acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>	
NW	43.978742°	-69.413721°	then 340.0 feet at 115° True to
NE	43.978340°	-69.412555°	then 500.0 feet at 208° True to
SE	43.977116°	-69.413411°	then 339.5 feet at 297° True to
SW	43.977521°	-69.414573°	then 498.2 feet at 27° True to NW

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

Feature	Distance
NE corner to Crow Island shoreline at MLW	~160' to the southeast
SE corner to Crow Island shoreline at MLW	~280' to the east
SW corner to Hog Island shoreline at MLW	~220' to the west
NW corner to Oar Island shoreline at MLW	~1,060' to the north

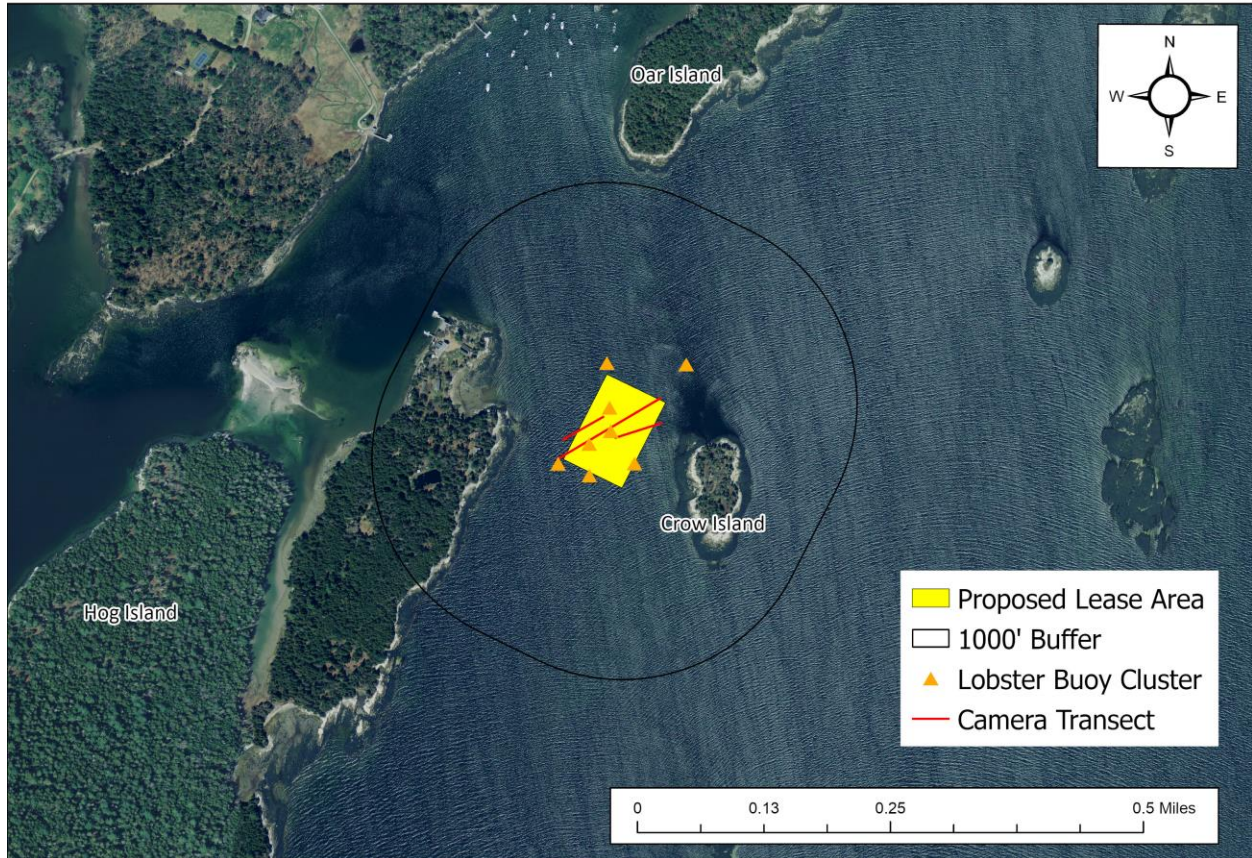


Figure 2. Proposed lease area with site visit observations.

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 within the vicinity of proposal during the site assessment. MDMR observed seven buildings on Hog Island. The closest building was located approximately 300 feet to the west of the proposal. MDMR also observed a mooring field approximately ¼ mile northwest of the proposal. Satellite imagery⁴ shows nearby Crow Island, located to the east of the proposal, has no structures.

⁴Not observed during MDMR’s site assessment. Data obtained from “Maine Orthoimagery Regional 2018”, collected May 2018.



(2) Navigation

The main navigational channel is located approximately 700 feet east of the proposal. However, vessels often transit between Hog Island and Crow Island. The proposal is located approximately 220 feet to the east of Hog Island at MLW and approximately 160 feet northwest of Crow Island at MLW. Red navigation buoy “16” is located approximately 950 feet northeast of the proposal (Figure 3).

During MDMR’s site visit, 12 total vessels were observed navigating near or within the proposal boundaries. One commercial fishing vessel and one recreational powerboat transited through the proposal. One commercial fishing vessel was observed to the east of the proposal. One commercial fishing vessel was documented traveling north while another was traveling south of the proposal. Three commercial fishing vessels were observed transiting easterly near the southern end of Crow Island. Three recreational powerboats were observed transiting easterly near the main navigational channel and one recreational powerboat was traveling north in the main navigational channel.

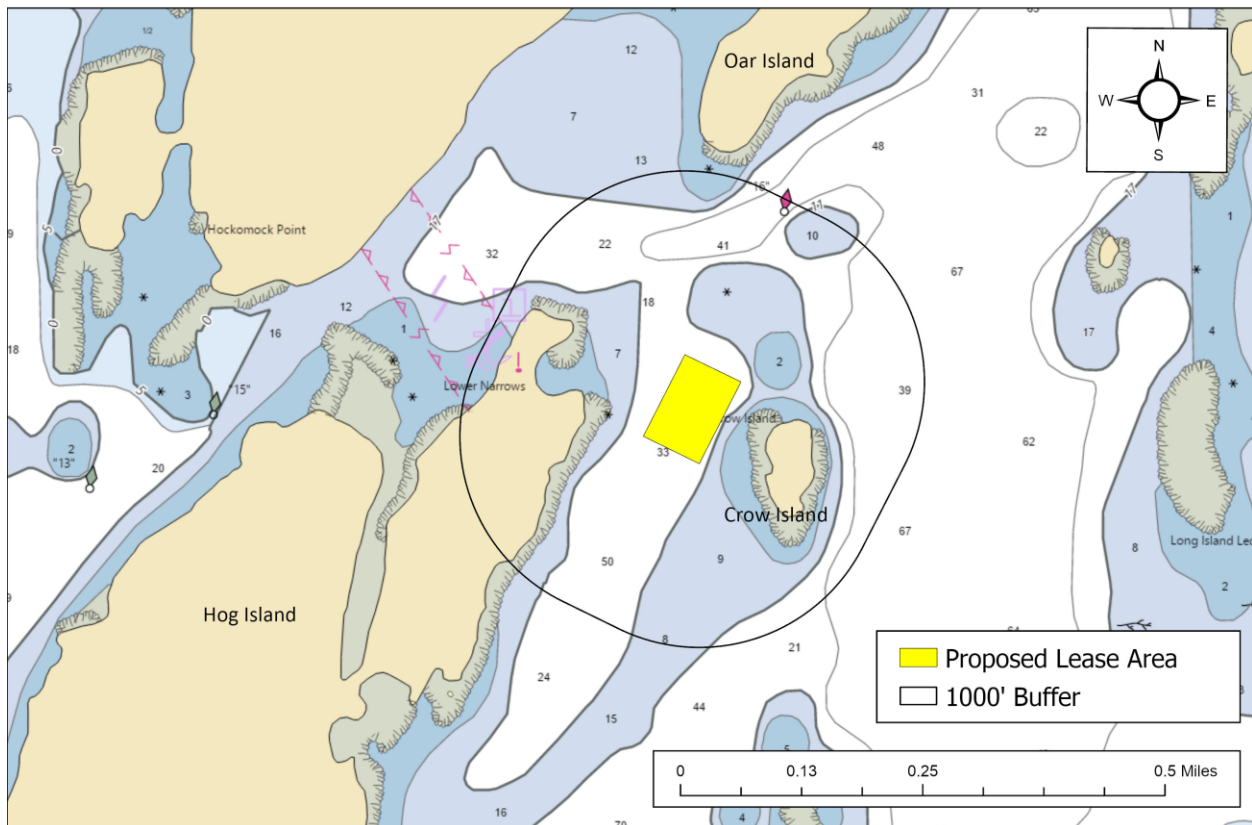


Figure 3. Proposed lease area, 1000’ buffer, navigation channels, and channel markers.



(3) Fishing and Other Uses

During the site visit, MDMR observed approximately 30-40 lobster buoys within the proposal boundaries and approximately 50 lobster buoys south of the proposal in the general vicinity (Figure 2). Additionally, MDMR observed active seaweed harvesting around nearby Crow Island.

(4) Other Aquaculture Uses

There are no aquaculture leases or limited purpose aquaculture (LPA) sites within 1,000 feet of the proposed lease site (Figure 4).

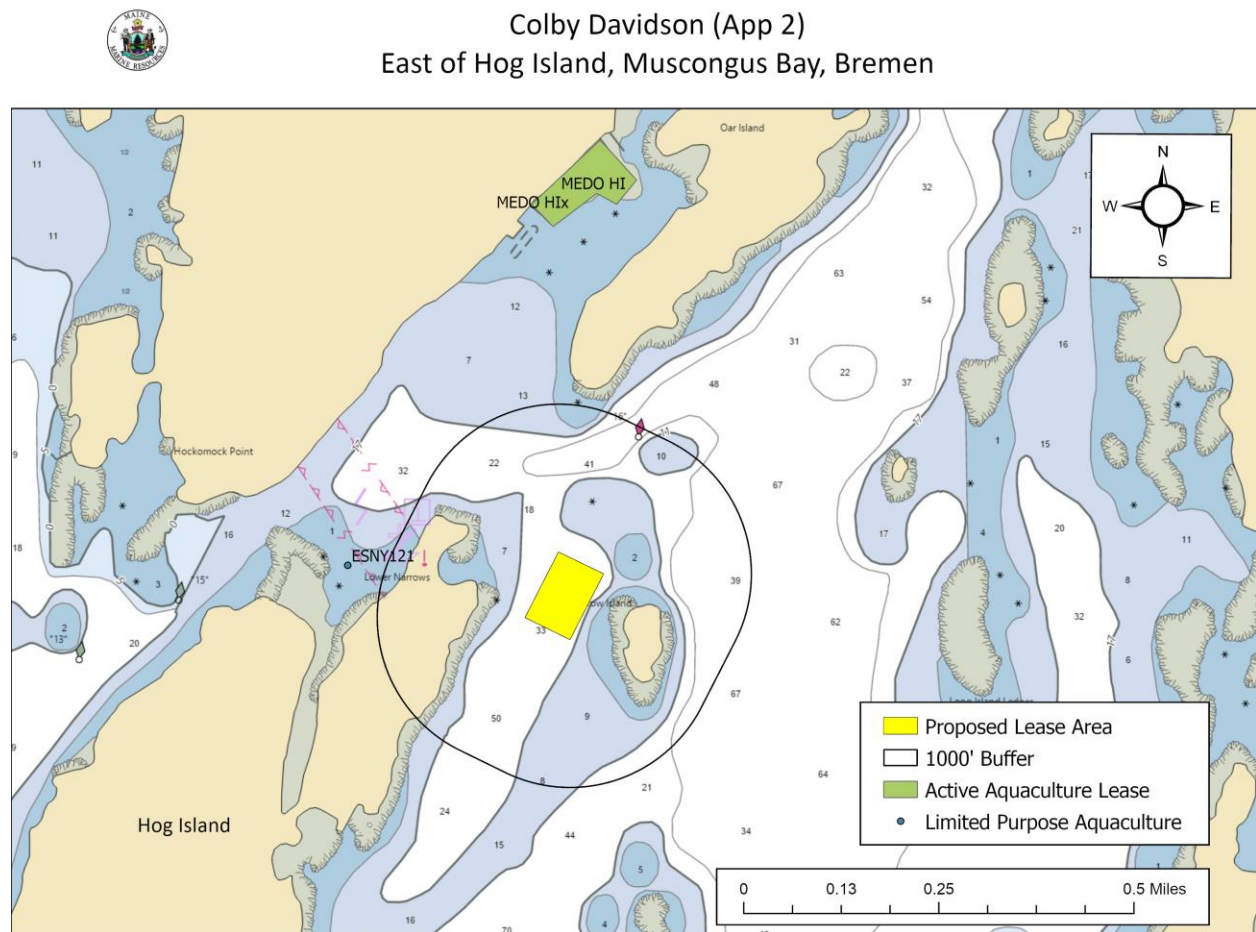


Figure 4. Aquaculture leases and LPA licenses in the general vicinity of the proposal.



(5) Existing System Support

Epibenthic Flora and Fauna

On July 17, 2023, MDMR scientists conducted underwater video transects utilizing a drop camera 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. In addition to the epibenthic flora and fauna observed, MDMR scientists observed double-crested cormorants (*Nannopterum auritum*), osprey (*Pandion haliaetus*), herring gulls (*Larinae argentatus*), common tern (*Sterna hirundo*), harbor seal (*Phoca vitulina*), and deceased gulf menhaden (*Brevoortia patronus*) in the general vicinity of the proposal.

Table 4. Species observed using underwater camera footage.

Species Observed	Abundance
American Lobster (<i>Homarus americanus</i>)	Abundant
Rock Barnacle (<i>Balanus balanoides</i>)	Occasional
Seaweed (<i>Ascophyllum sp.</i>)	Occasional
Crab (<i>Cancer sp.</i>)	Occasional

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 85 feet east of the proposal (Figure 5).⁵ During the site assessment, MDMR scientists observed eelgrass drifting on the surface of the water within the proposal boundaries, as well as eelgrass drifting in the vicinity of the proposal. No eelgrass was observed attached to the seafloor on underwater camera footage.

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.

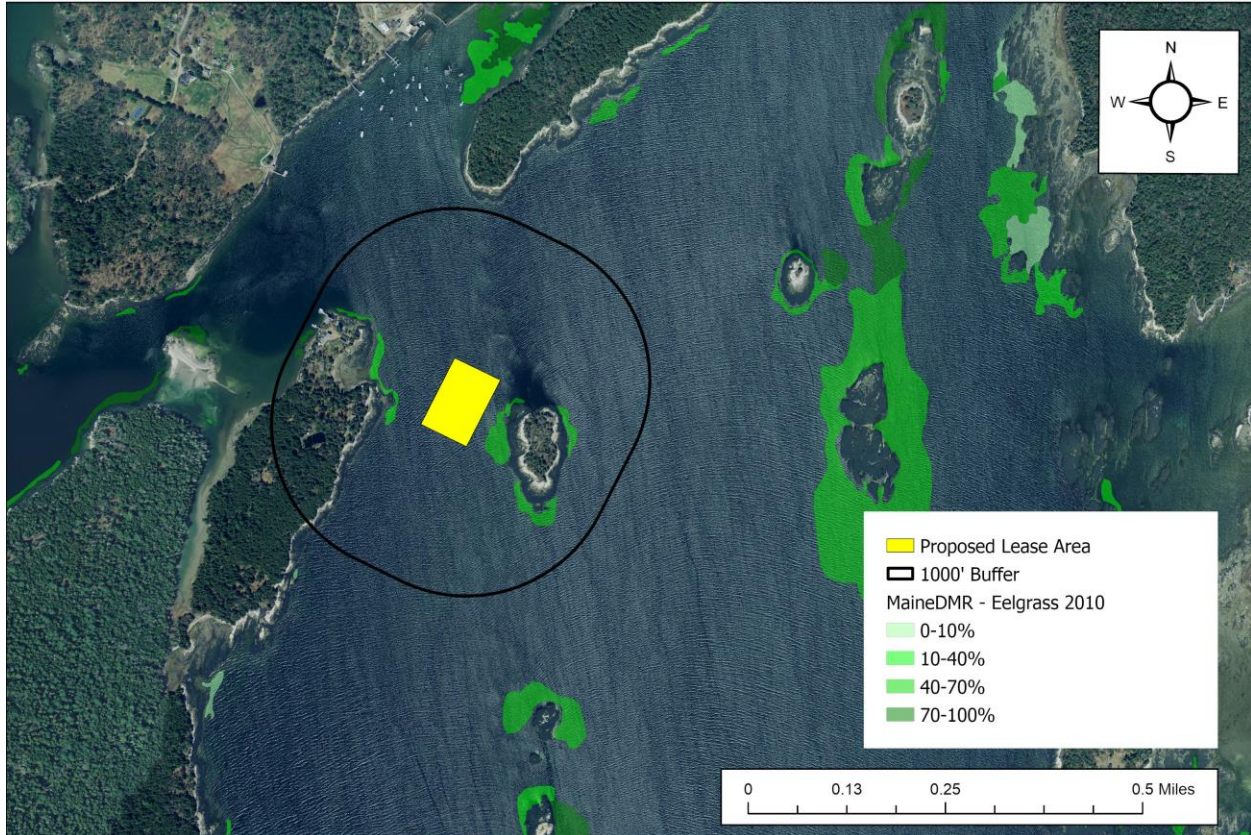


Figure 5. Mapped eelgrass (*Z. marina*) near the proposed lease utilizing 2010 data.

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 closest mapped tidal waterfowl and wading bird habitat is approximately 1,650 feet north of the proposal. 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 3,000 feet west of the proposal (Figure 6).

On October 11, 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.⁶

⁶ Email correspondence between MDIFW and MDMR.



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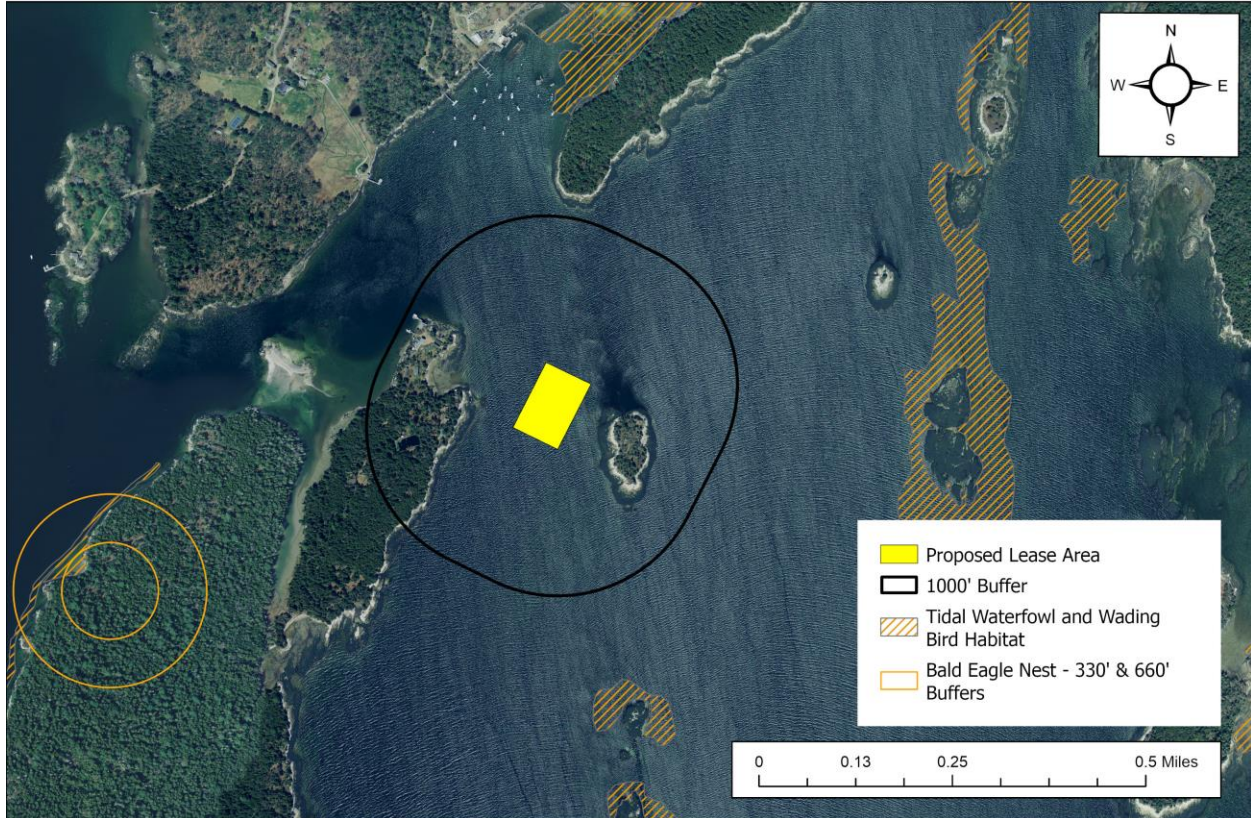


Figure 6. Mapped Tidal Wading Bird and Waterfowl Habitat⁷ and Bald Eagle nests⁸.

(6) Interference with Public Facilities

The proposed lease is not located 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 “Open/Approved” by the MDMR Bureau of Public Health.

⁷ Data obtained from MDIWF maintained SDE Feature Class “GISVIEW.MEIFW.Twwh”.

⁸ Data obtained from USFWS “Bald_Eagle_Nests_-_Maine_2023”.