



Maine Department of Marine Resources
Site Report

Colby Davidson (App 1)
East of Hog Island, Muscongus Bay
Bremen



Colby Davidson - East of Hog Island, Bremen (App 1)

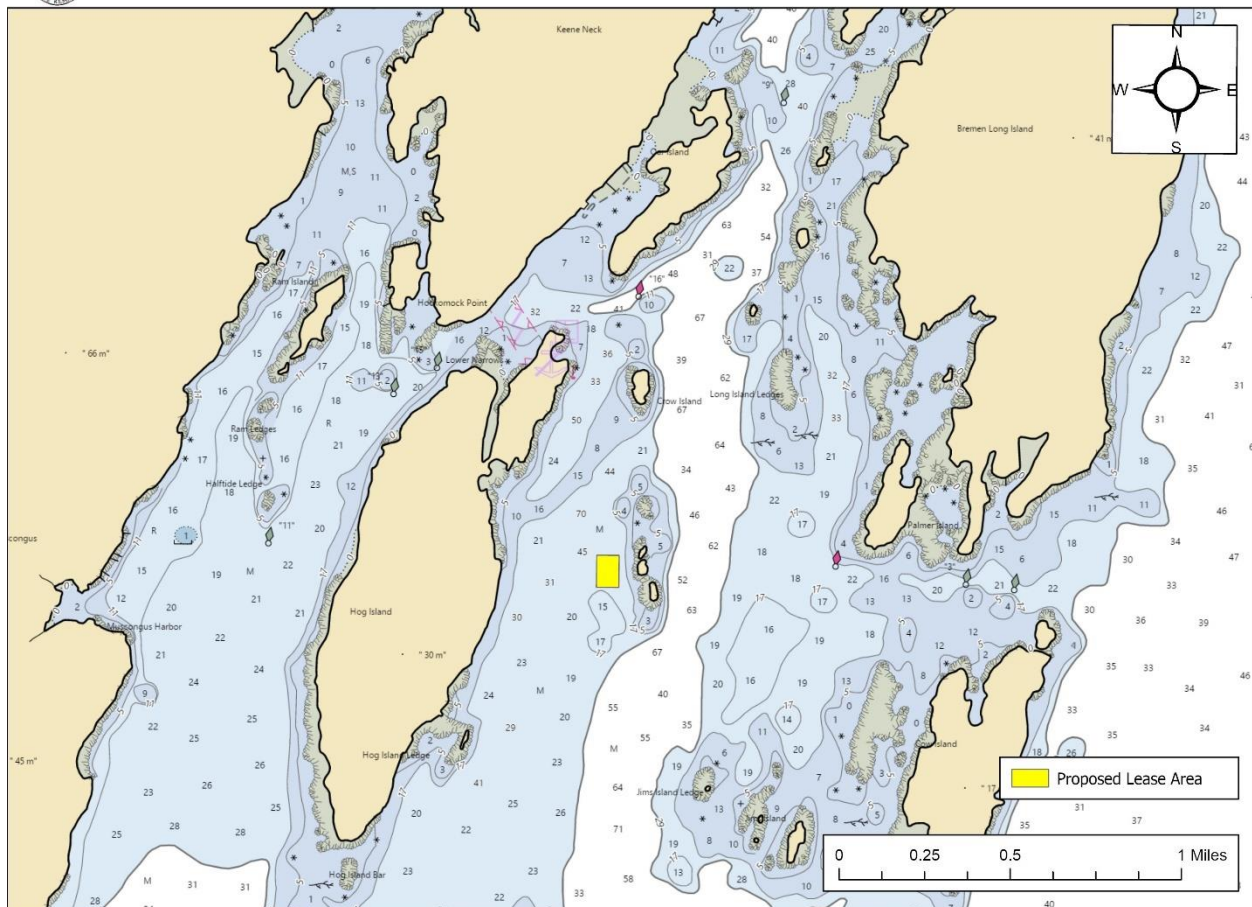


Figure 1. Vicinity map.¹

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: 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.



Maine Department of Marine Resources Site Report

Colby Davidson (App 1)
East of Hog Island, Muscongus Bay
Bremen

Application Overview

The applicant, Colby Davidson, is requesting 3.93² 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, mooring chain, four mooring lines, and four mooring balls from June 1 through October 31.³

General Characteristics

On July 17, 2023, Maine Department of Marine Resources (MDMR) scientists assessed the proposed lease site. MDMR scientists arrived on site at approximately 11:55 AM. The eastern shore of Hog Island, in the vicinity of the proposal, consists of rocky coastline leading to coniferous uplands. Crotch Islands, located east of the proposal, are small, undeveloped subtidal islands with some coniferous trees.

Depth

MDMR staff began collecting depths at the proposed site shortly after high tide at approximately 11:58 AM. Measured depths at corners of the proposed lease site ranged from 28.2 to 42.4 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 19.8 to 34.0 feet (Table 1).

Table 1. Predicted tidal heights in Friendship, Maine.⁴

Date	Time	Height (ft)
2023/07/17	5:39 AM	0.1 L
2023/07/17	11:43 AM	8.4 H
2023/07/17	5:36 PM	1.4 L
2023/07/17	11:44 PM	9.8 H

Bottom Characteristics

MDMR staff observed the bottom characteristics of the proposed lease site via a drop-camera transect. 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.

² Applicant originally requested 4 acres. DMR calculations indicate the area is 3.93 acres.

³ Application page 5

⁴ <https://www.usharbors.com/harbor/maine/friendship-harbor-me/tides/?tide=2023-07#monthly-tide-chart>



Maine Department of Marine Resources Site Report

Colby Davidson (App 1)
East of Hog Island, Muscongus Bay
Bremen

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) – 3.93 Acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>	
NW	43.969915°	-69.414077°	then 347.1 feet at 90° True to
NE	43.969915°	-69.412758°	then 494.1 feet at 180° True to
SE	43.968559°	-69.412763°	then 347.4 feet at 270° True to
SW	43.968563°	-69.414083°	then 492.7 feet at 0° True to NW

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

Feature	Distance
NE corner to Crotch Islands at MLW	~240' to the east
SE corner to Crotch Islands at MLW	~310' to the east
SW corner to Hog Island shoreline at MLW	~1,515' to the west
NW corner to Hog Island shoreline at MLW	~1,400' to the west



Maine Department of Marine Resources Site Report

Colby Davidson (App 1)
East of Hog Island, Muscongus Bay
Bremen



Colby Davidson - East of Hog Island, Bremen (App 1)

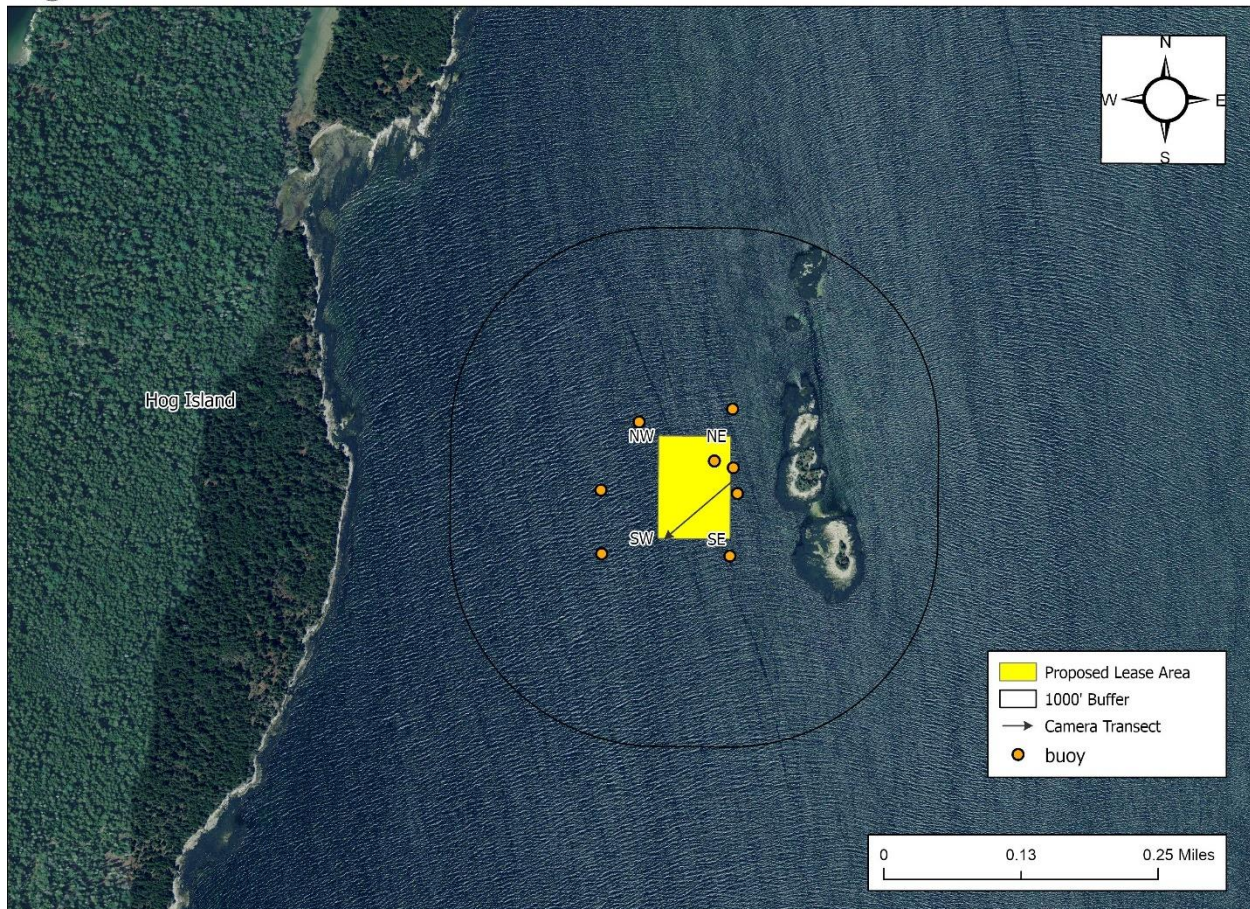


Figure 2. Proposed lease area with corner labels, 1000' buffer, camera transect, and site visit observations.

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 Crotch Islands, located to the east of the proposal, are owned by the State of Maine and no docks or other structures were observed at the time of the site visit. Nearby Hog Island, located to the west of the proposal, is owned by the National Audubon Society and no docks or other structures were observed in the vicinity of the proposal at the time of the site visit.



(2) Navigation

The proposal is located approximately 240 feet to the west of Crotch Islands at MLW. There is approximately 1,400 feet of navigable water between the proposal and the eastern shore of Hog Island at MLW. The main navigational channel is located to the east of Crotch Islands. The center of the main navigational channel is approximately 1,200 feet to the east of the proposal (Figure 3). During MDMR's site visit, recreational powerboats were observed transiting in the main navigational channel to the east of Crotch Islands. One recreational powerboat was observed transiting between Hog Island and the western boundary of the proposal.



Colby Davidson - East of Hog Island, Bremen (App 1)

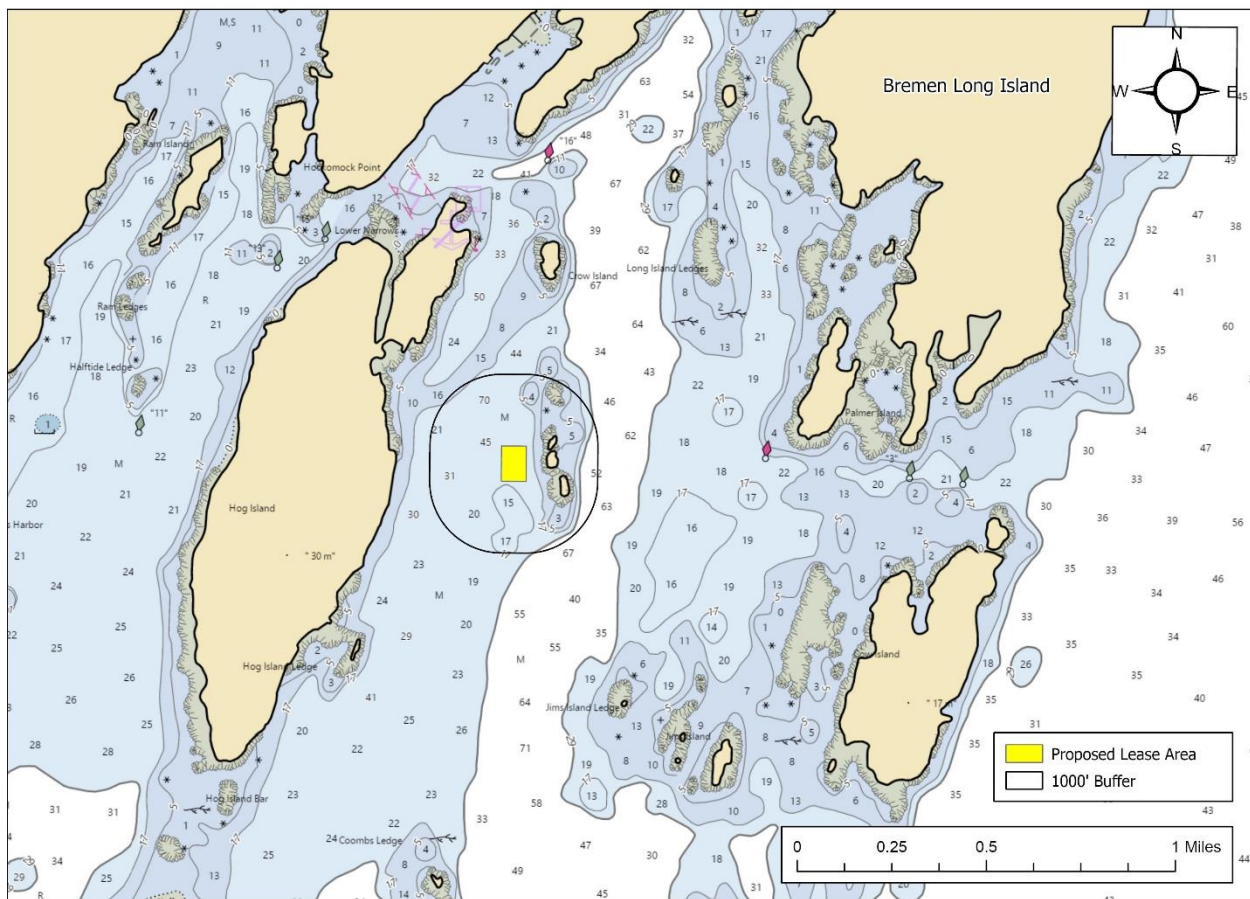


Figure 3. Proposed lease area, 1000' buffer, navigation channels, and channel markers.

(3) Fishing and Other Uses

During the site visit, MDMR documented lobster buoys within the proposal boundaries 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 proposal boundaries and one buoy was located on the eastern boundary of the proposal. There were approximately ten



Maine Department of Marine Resources Site Report

Colby Davidson (App 1)
East of Hog Island, Muscongus Bay
Bremen

lobster buoys located between Crotch Islands and the eastern boundary of the proposal. There were approximately 30 buoys located to the north of the proposal and approximately 30 located to the west of the proposal. MDMR observed lobster within the proposal boundaries (*Homarus americanus*) on the underwater camera footage collected during the site visit.

(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).

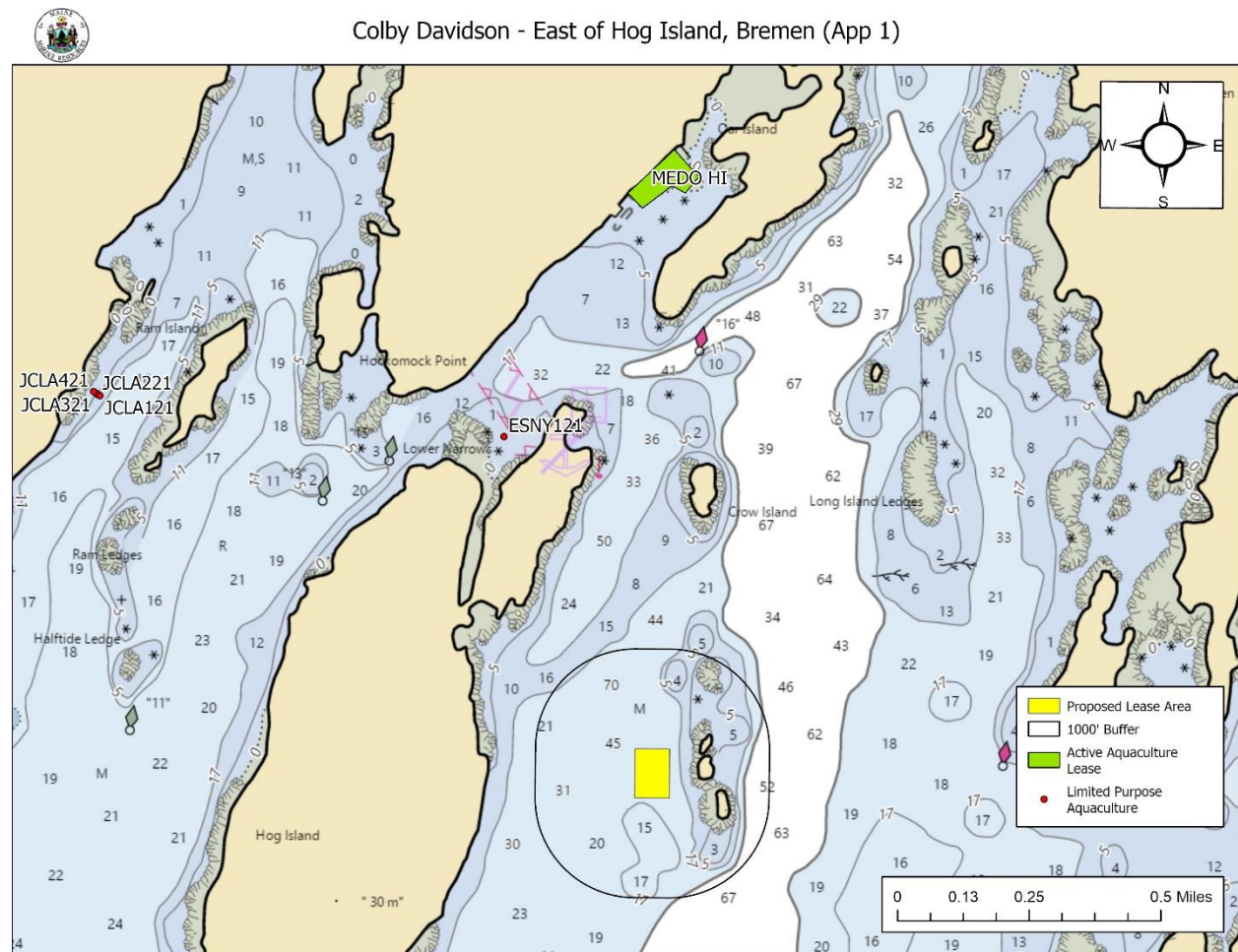


Figure 4. Aquaculture leases and Limited Purpose Aquaculture (LPA) licenses in the general area of the proposal.



Maine Department of Marine Resources Site Report

Colby Davidson (App 1)
East of Hog Island, Muscongus Bay
Bremen

(5) Existing System Support

Epibenthic Flora and Fauna

On July 17, 2023, MDMR scientists conducted a drop-camera transect 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, there were double-crested cormorants (*Nannopterum auritum*), osprey (*Pandion haliaetus*), an osprey nest, and gulls (*Larinae* spp.) in the general vicinity of the proposal.

Table 4. Species observed using underwater camera footage.

Species Observed	Abundance
American Lobster (<i>Homarus americanus</i>)	Occasional
Crab (<i>Cancer</i> spp)	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 165 feet east of the proposal (Figure 5).⁵ Eelgrass blades were observed drifting on the surface of the water in the vicinity of the proposal. No eelgrass was observed on underwater camera footage within the proposal boundaries during MDMR's site assessment.

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.



Colby Davidson - East of Hog Island, Bremen (App 1)

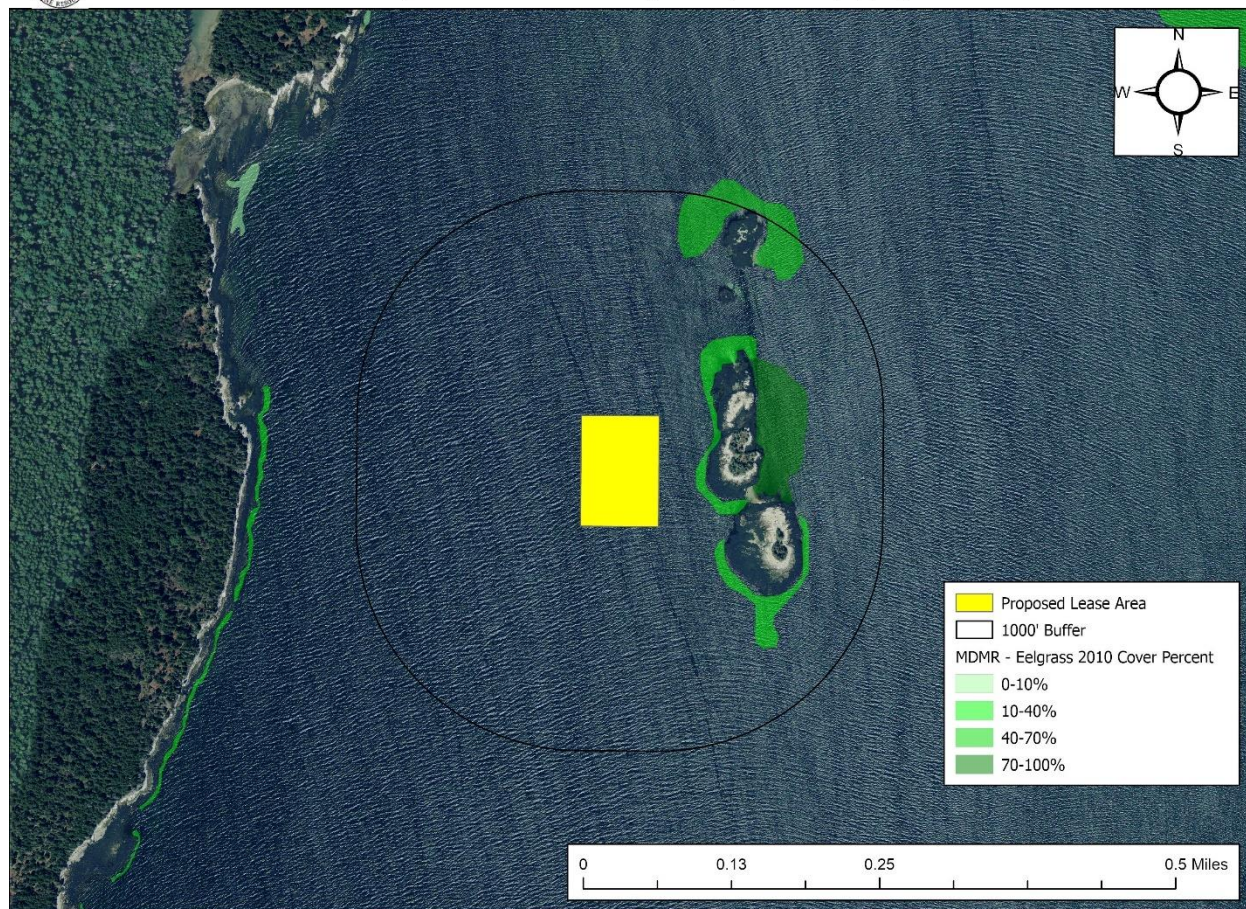


Figure 5. Mapped eelgrass (*Z. marina*) near the proposed lease utilizing 2010 data.

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 proposed lease is located approximately 165 feet to the west of mapped tidal waterfowl and wading bird habitat. 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 0.63 miles northwest of the proposal (Figure 6).

On October 12, 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



Maine Department of Marine Resources Site Report

Colby Davidson (App 1)
East of Hog Island, Muscongus Bay
Bremen



Colby Davidson - East of Hog Island, Bremen (App 1)

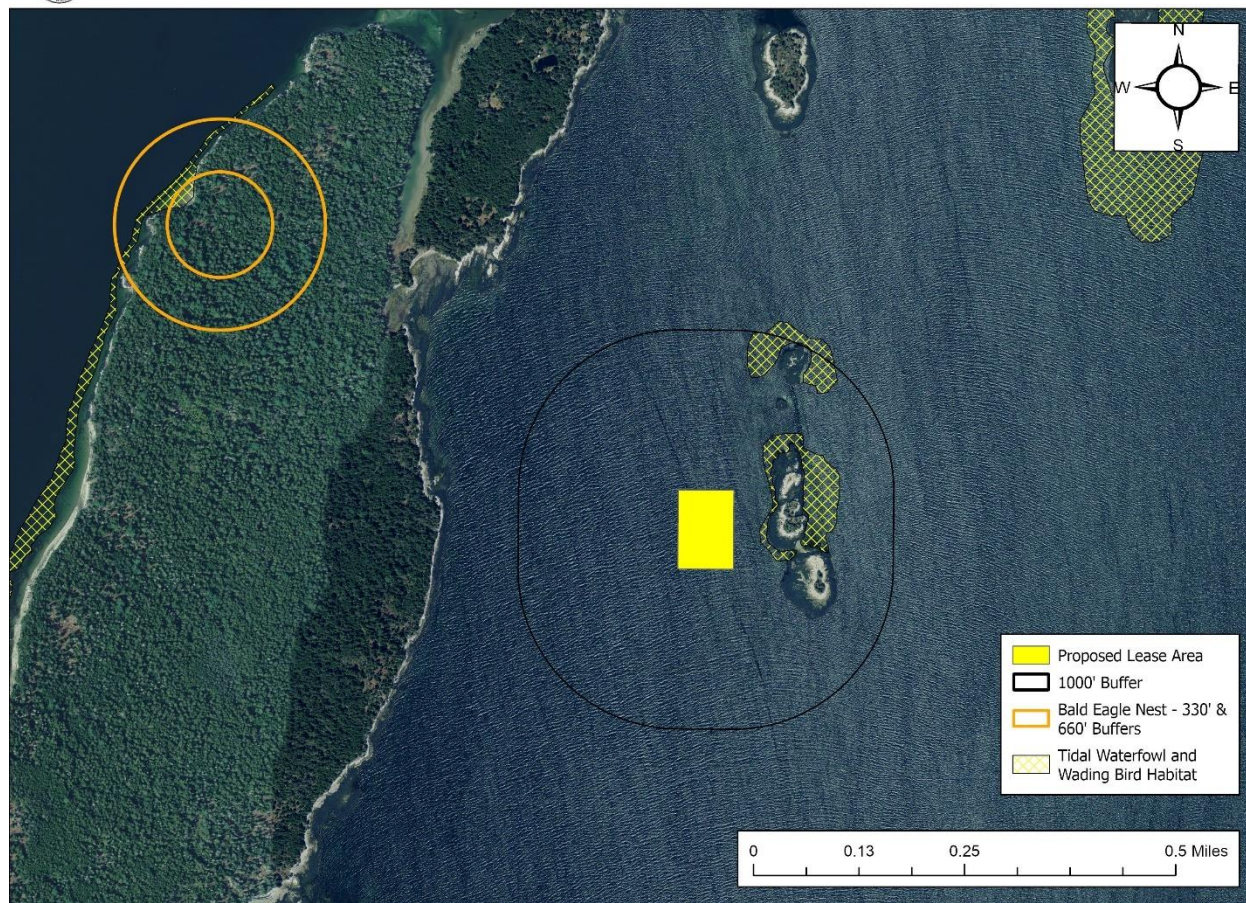


Figure 6. Mapped Bald Eagle nests⁷ and Tidal Wading Bird and Waterfowl Habitat⁸.

(6) Water Quality

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

(7) Public Facilities

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

⁷ Data obtained from USFWS “Bald_Eagle_Nests_-_Maine_2023”

⁸ Data obtained from MDIWF maintained SDE Feature Class “GISVIEW.MEIFW.Twwh”



Maine Department of Marine Resources Site Report

Colby Davidson (App 1)
East of Hog Island, Muscongus Bay
Bremen