



Christopher Green
The Reach, Outer Harpswell Sound, Brunswick

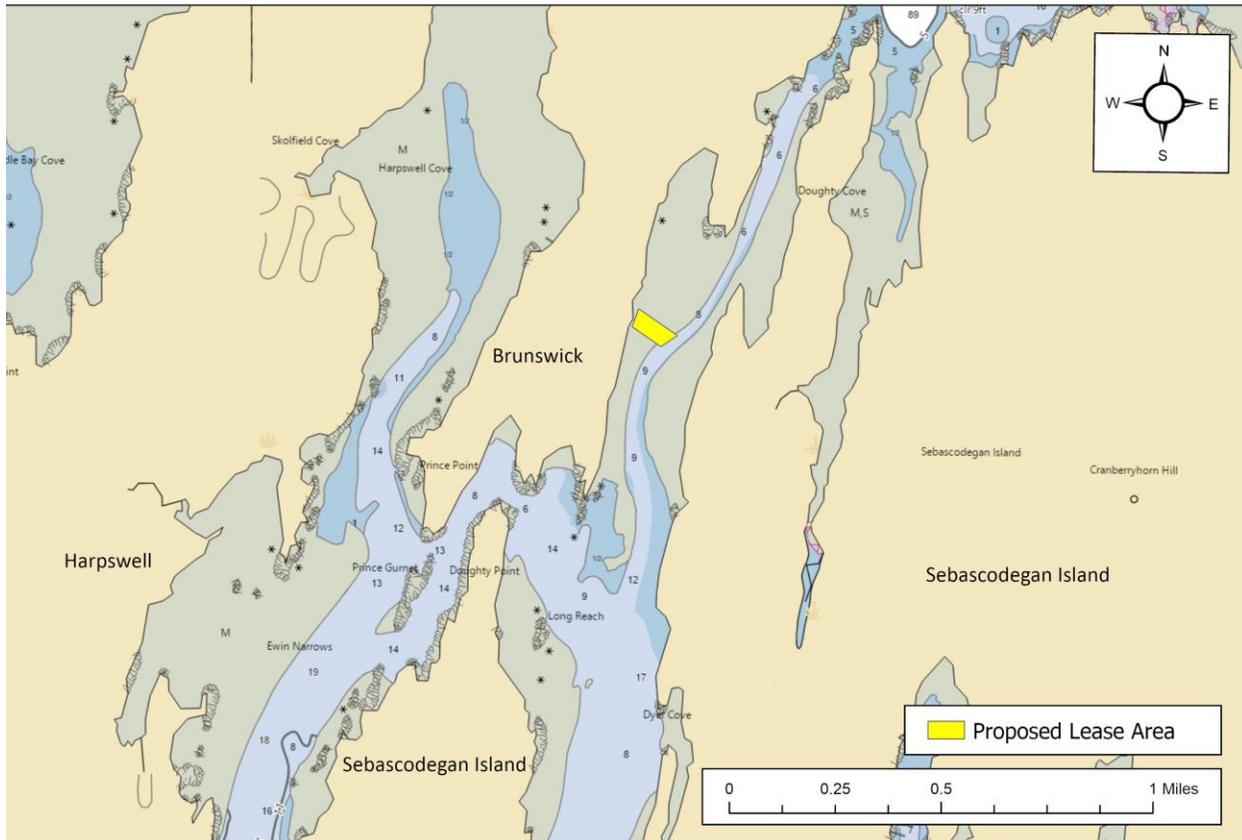


Figure 1. Vicinity map.¹

Location: The Reach, Outer Harpswell Sound, Brunswick, Cumberland County, Maine

Purpose: Experimental lease for suspended culture of hard clams/quahogs (*Mercenaria mercenaria*), soft-shell clams (*Mya arenaria*), and Atlantic razor clams (*Ensis directus*).

Site Review: Meryl Grady, 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 georeferenced aerial photographs provided by The Maine Office of GIS.



Application Overview

The applicant, Christopher Green, is requesting 2.71 acres in The Reach in Brunswick for the culture of shellfish. All gear will be secured to the sea floor and removed from the site before ice is expected to form. Marker buoys will remain on site year-round.²

General Characteristics

On July 26, 2023, Maine Department of Marine Resources (MDMR) scientists assessed the proposed lease site beginning at 3:00 PM. The eastern shoreline consists of a rocky shoreline leading to mixed forest uplands in the vicinity of the proposal. The western shoreline consists of a rocky shoreline with mixed forest uplands and two residential houses visible from the proposed lease area.

Depth

MDMR scientists began collecting depths at 3:00 PM at the proposed site, which was approximately three hours before high tide. Measured depths at corners of the proposed lease site ranged from 3.5 to 9.2 feet. Correcting for tidal variation derives water depths at the corners of the proposal at the next high tide to be from 7.0 to 12.7 feet and from 0.0 to 3.7 feet at mean low water (MLW, 0.0 feet) (Table 1). The proposed lease is partially located within the intertidal.

Table 1. Predicted tidal heights in South Harpswell, Maine.³

Date	Time	Height (ft)
2023/07/26	5:32 AM	8.1 H
2023/07/26	11:34 AM	1.3 L
2023/07/26	5:55 PM	9.0 H

Bottom Characteristics

MDMR scientists 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 primarily 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 Rubble

² Application pages 5 and 6

³ <https://www.us harbors.com/harbor/maine/south-harpswell-me/tides/?tide=2023-07#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) – 2.71 Acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>	
NW	43.847746°	-69.928085°	then 586.3 feet at 124° True to
NE	43.846843°	-69.926245°	then 248.1 feet at 236° True to
SE	43.846458°	-69.927021°	then 435.6 feet at 305° True to
SW	43.847128°	-69.928389°	then 239.1 feet at 20° True to NW

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

Feature	Distance
NE corner to Sebascodegan Island shoreline at MLW	~115' to the east
NE corner to Sebascodegan Island shoreline at MHW	~425' to the east
SE corner to Sebascodegan Island shoreline at MLW	~140' to the east
SW corner to mainland	~40' to the west



Figure 2. Proposed lease area with site visit observations.⁴

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

During the site assessment, MDMR scientists observed a set of stairs accessing the shoreline approximately 317 feet north of the proposal. There were no docks or moorings observed in the vicinity of the proposal.

⁴ Aerial photographs obtained from ESRI “World Imagery (Firefly)” Layer.



The western corners of the proposed lease area are located within the intertidal. The applicant, Christopher Green, received necessary permissions from the nearby riparian landowner for use of their intertidal property.

(2) Navigation

According to navigational charts, the proposal is located partially within the navigational channel at MLW (Figure 3). The applicant indicates the proposal is located outside of the main navigational channel according to both personal observations and satellite imagery.⁵ During the site assessment, MDMR scientists confirmed the navigational channel is located further east than charted, therefore the proposal is located west of the main navigational channel. MDMR scientists observed one small tiller driven boat navigating northerly approximately 100 feet east of the proposal.

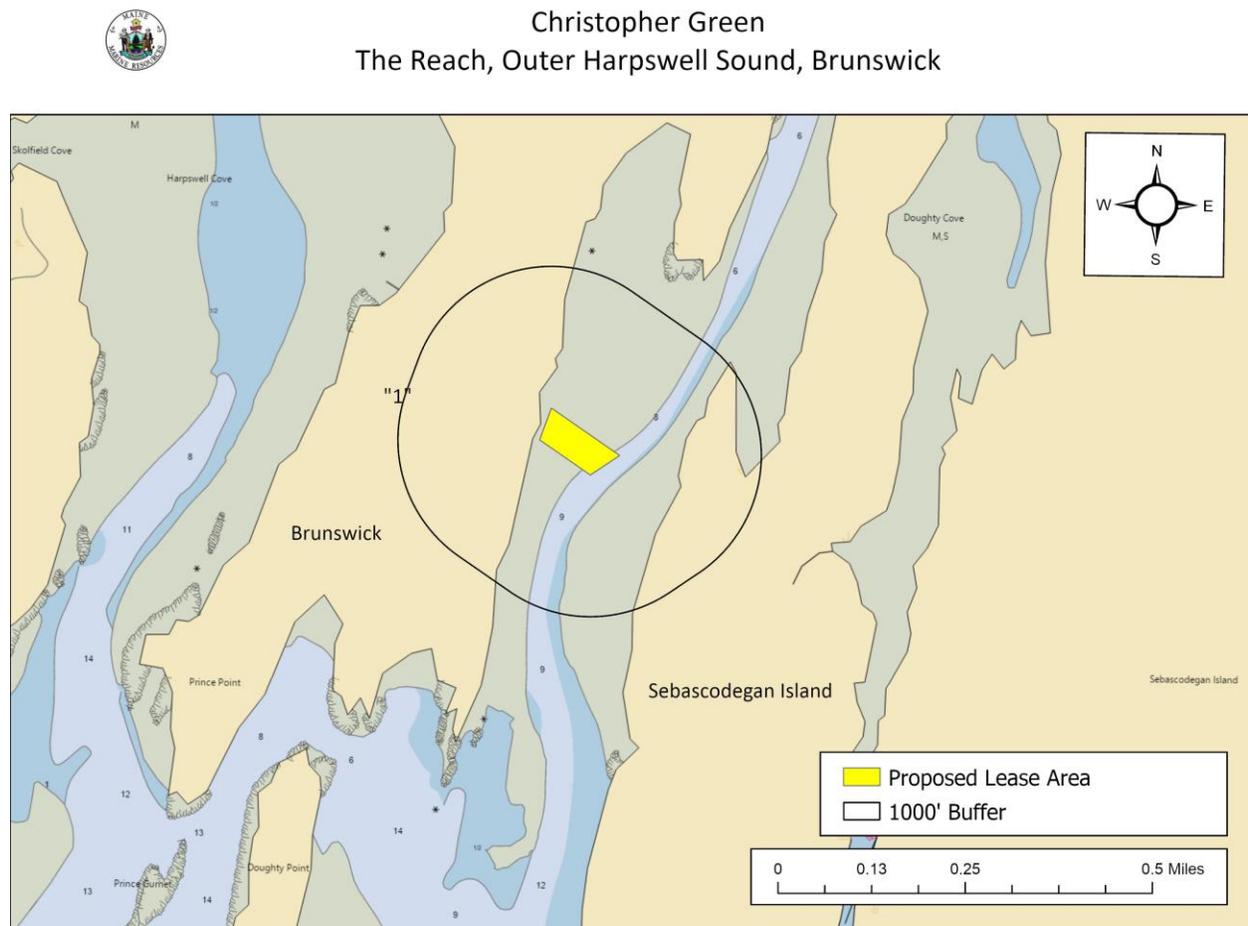


Figure 3. Proposed lease area, 1000’ buffer, navigation channels, and channel markers.

⁵ Application page 7.



(3) Fishing and Other Uses

During the site visit, MDMR did not observe any fishing activity within the vicinity of the proposal. On November 15, 2021, MDMR received a comment from the Brunswick Harbormaster stating that nearby Robbies Cove, located approximately 1,500 feet north of the proposal, is dug for soft-shell clams and quahogs. Harvesting in Robbies Cove occurs mostly during the winter as the cove is less likely to ice over. The harbormaster notes he has never observed anyone harvesting south of Limited Purpose Aquaculture (LPA) license CGRE321.⁶ This LPA is held by Christopher Green and is approximately 102 feet north of the proposal. The Town of Brunswick has a shellfish conservation program in accordance with 12 M.R.S.A. § 6671 and because the site is partially within the intertidal, the applicant is required to obtain consent from the municipality. The applicant provided this permission with the application.

(4) Other Aquaculture Uses

There is one active LPA, CGRE321, within 1,000 feet of the proposed lease site (Figure 4). CGRE321 is approximately 102 feet north of the proposal and held by the applicant. CGRE321 would be relinquished if this proposal were granted.

⁶ Email correspondence between MDMR and the Brunswick Harbormaster.



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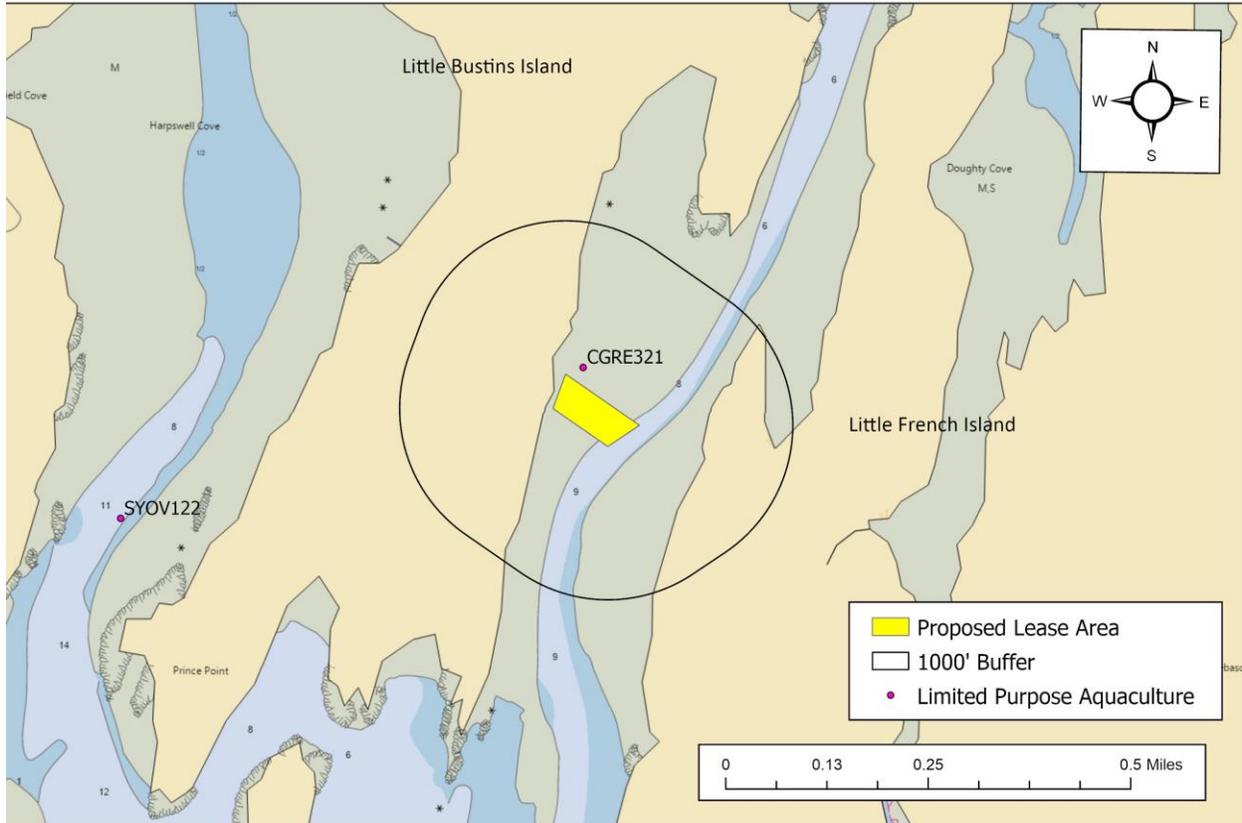


Figure 4. Aquaculture leases and LPA licenses in the vicinity of the proposal.

(5) Existing System Support

Epibenthic Flora and Fauna

On July 26, 2023, MDMR scientists conducted an underwater video transect utilizing a drop camera to assess the epibenthic ecology of the proposed lease. There were no living epibenthic flora or fauna observed in the video transect, however there were softshell clam shells observed within the boundaries of the proposal.

Eelgrass (*Zostera marina*)

Data collected by the Maine Department of Environmental Protection (MDEP) and Casco Bay Estuary Partnership (CBEP) in 2022 indicates no mapped eelgrass presence in the vicinity of the



proposal (Figure 5).⁷ No eelgrass was observed on underwater camera footage during MDMR’s site assessment.



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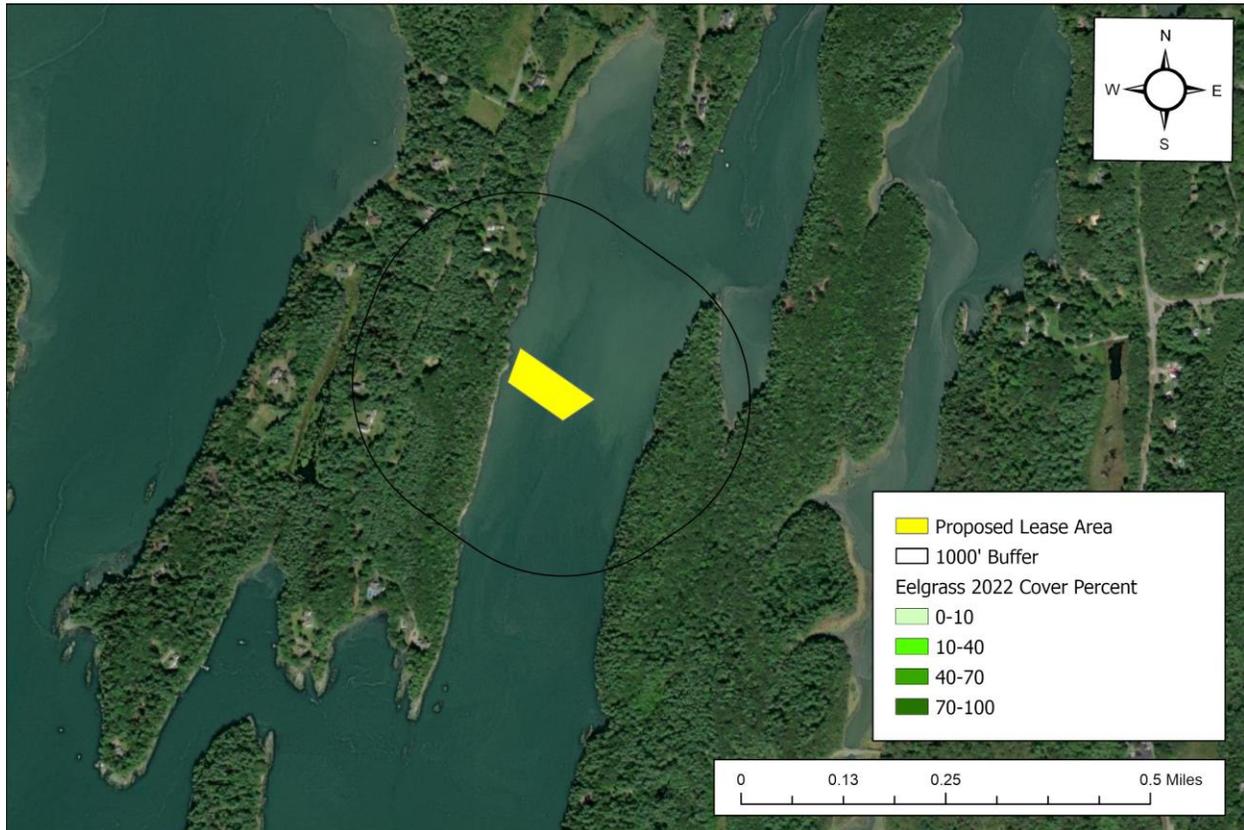


Figure 5. Mapped eelgrass (*Z. marina*) near the proposed lease utilizing 2022 data⁸.

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. 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 4,160 feet southwest of the proposal (Figure 6). MDMR scientists also observed osprey (*Pandion haliaetus*) and a bald eagle (*Haliaeetus leucocephalus*) in the general vicinity of the proposal.

⁷ Data obtained from The Maine Office of GIS “GISVIEW.MEDEP.Seagrass2022_CascoBay”. This is the most current record of mapped eelgrass within the vicinity of the proposal.

⁸ Aerial photographs obtained from ESRI “World Imagery (Firefly)” Layer.



On January 4, 2023, a Wildlife Biologist with MDIFW responded by email to a “Request for Agency Review and Comment” stating this proposal is located entirely within high value Tidal Waterfowl and Wading Bird Habitat. MDIFW recommends that no gear is placed in less than three feet of water at MLW. MDIFW recommends finding an alternative location with greater than 3 feet of water at MLW to minimize the impacts to habitat and wildlife utilizing this resource.⁹



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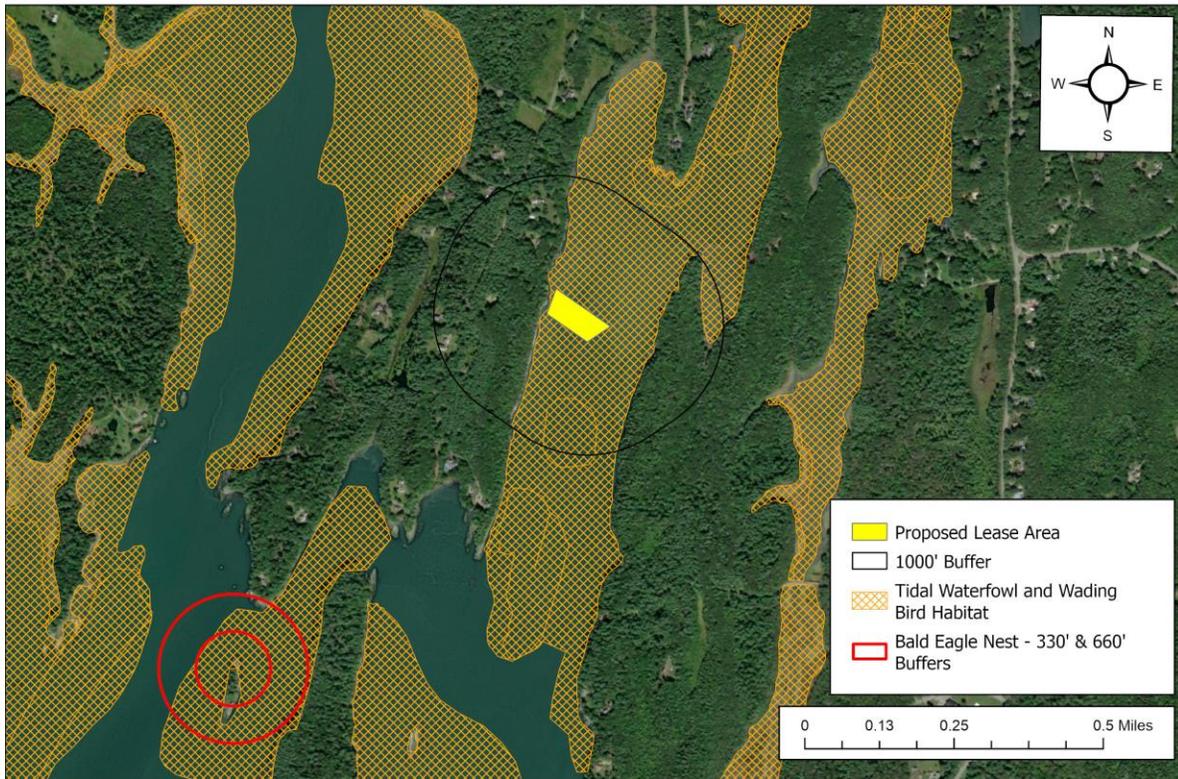


Figure 6. Mapped Tidal Waterfowl and Wading Bird Habitat and Bald Eagle nests.¹⁰

(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.

⁹ Email correspondence between MDIFW and MDMR.

¹⁰ Aerial photographs obtained from ESRI “World Imagery (Firefly)” Layer. Data obtained from MDIWF maintained SDE Feature Class “GISVIEW.MEIFW.Twwh” and from USFWS “Bald_Eagle_Nests_-_Maine_2023”.



**Maine Department of Marine Resources
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(7) Water Quality

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

On November 2, 2021, a staff member from the Bureau of Public Health responded by email to a “Request for Agency Review and Comment”, stating the applicant is proposing to grow razor clams, which are considered a high-risk species, in a high-risk area for biotoxins. This will require a memorandum of understanding and self-funding for testing.¹¹

¹¹ Email correspondence from MDMR Bureau of Public Health.