



Maine Department of Marine Resources
Site Report

Dirigo Marine Resources, LLC
Northeast of Moshier Island, Casco Bay
Yarmouth and Freeport



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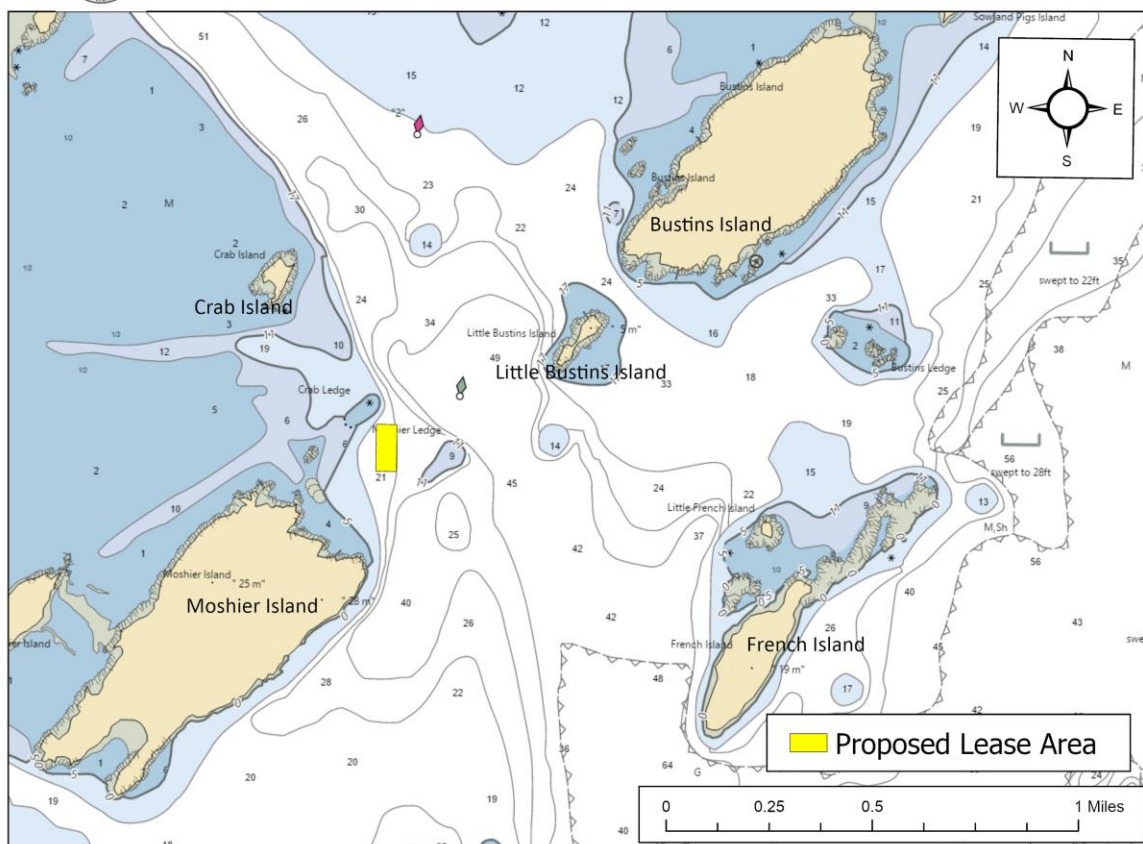


Figure 1. Vicinity map.¹

Location: Northeast of Moshier Island, Yarmouth and Freeport, Casco Bay, Cumberland County, Maine

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

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.



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Application Overview

The applicant, Dirigo Marine Resources LLC., is requesting 3.64² acres northeast of Moshier Island in Casco Bay for the suspended culture of marine algae. The applicant intends to remove all gear, except mooring blocks and marking buoys, from June 1 through October 31.³

General Characteristics

On July 19, 2023, Maine Department of Marine Resources (MDMR) scientists assessed the proposed lease site beginning at 11:30 AM. The northeastern shore of Moshier Island, in the vicinity of the proposal, consists of rocky coastline leading to coniferous uplands.

Depth

MDMR scientists began collecting depths at 11:30 AM at the proposed site, which was approximately two hours before high tide. Measured depths at corners of the proposed lease site ranged from 27.6 to 36.6 feet. Correcting for tidal variation derives water depths at the corners of the proposal at the next high tide to be from 29.4 to 38.4 feet and from 20.8 to 29.8 feet at mean low water (MLW, 0.0 feet) (Table 1).

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

Date	Time	Height (ft)
2023/07/19	12:41 AM	9.8 H
2023/07/19	7:09 AM	0.2 L
2023/07/19	1:20 PM	8.6 H
2023/07/19	7:07 PM	1.4 L

Bottom Characteristics

MDMR scientists observed the bottom characteristics of the proposed lease site via a remotely operated vehicle (ROV) 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.

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 3.9 acres. MDMR calculations indicate the area is 3.64 acres.

³ Application pages 4 and 5

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



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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) – 3.64 Acres

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>	
NW	43.79035°	-70.09010°	then 264.0 feet at 90° True to
NE	43.79035°	-70.08910°	then 601.3 feet at 180° True to
SE	43.78870°	-70.08910°	then 264.0 feet at 270° True to
SW	43.78870°	-70.09010°	then 601.3 feet at 0° True to NW

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

Feature	Distance
NE corner to green navigational buoy “1”	~900’ to the northeast
SE corner to Moshier Island shoreline at MLW	~1,140’ to the southwest
SW corner to Moshier Island shoreline at MLW	~1,100’ to the southwest
NW corner to Crab Island shoreline at MLW	~1,950’ to the northwest



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 scientists observed four lobster buoys and eight moorings within 1,000 feet of the proposal. The mooring nearest to the proposal was located approximately 675 feet to the southwest of the site. Four docks were observed on Moshier Island located 1,070 feet, 1090 feet, 1,220 feet, and 1,640 feet from the proposal. According to satellite imagery⁵, nearby Little Bustins Island, located to the northeast of the proposal, has one building and pier. Satellite imagery also

⁵Not observed during MDMR's site assessment. Data for satellite imagery obtained from "Maine Orthoimagery Coastal Casco Bay 2018", collected June 2018.



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indicates that nearby Crab Island, located to the northwest of the proposal, has one building. Both Little Bustins Island and Crab Island are privately owned.

(2) Navigation

The proposal is located approximately 1,100 feet to the northeast of Moshier Island at MLW. The main navigational channel is located to the east of the proposal. Green navigation buoy "1" is located approximately 900 feet to the northeast of the proposal (Figure 3). During MDMR's site visit, one commercial fishing boat was observed navigating to the west of the proposed site by the northern ledge of Moshier Island.

A Harbormaster Questionnaire was sent to the Town of Yarmouth and the local harbormaster responded on September 4, 2022, stating the proposal location may affect navigation within the area whether transiting through the area or accessing nearby moorings held by residents of Moshier Island. The harbormaster indicated that although the proposal is located outside of the marked navigation channel, year-round commercial users transit the area, and it is part of the harbormaster's patrol route.⁶

⁶ Harbormaster questionnaire received by MDMR on September 4, 2022.



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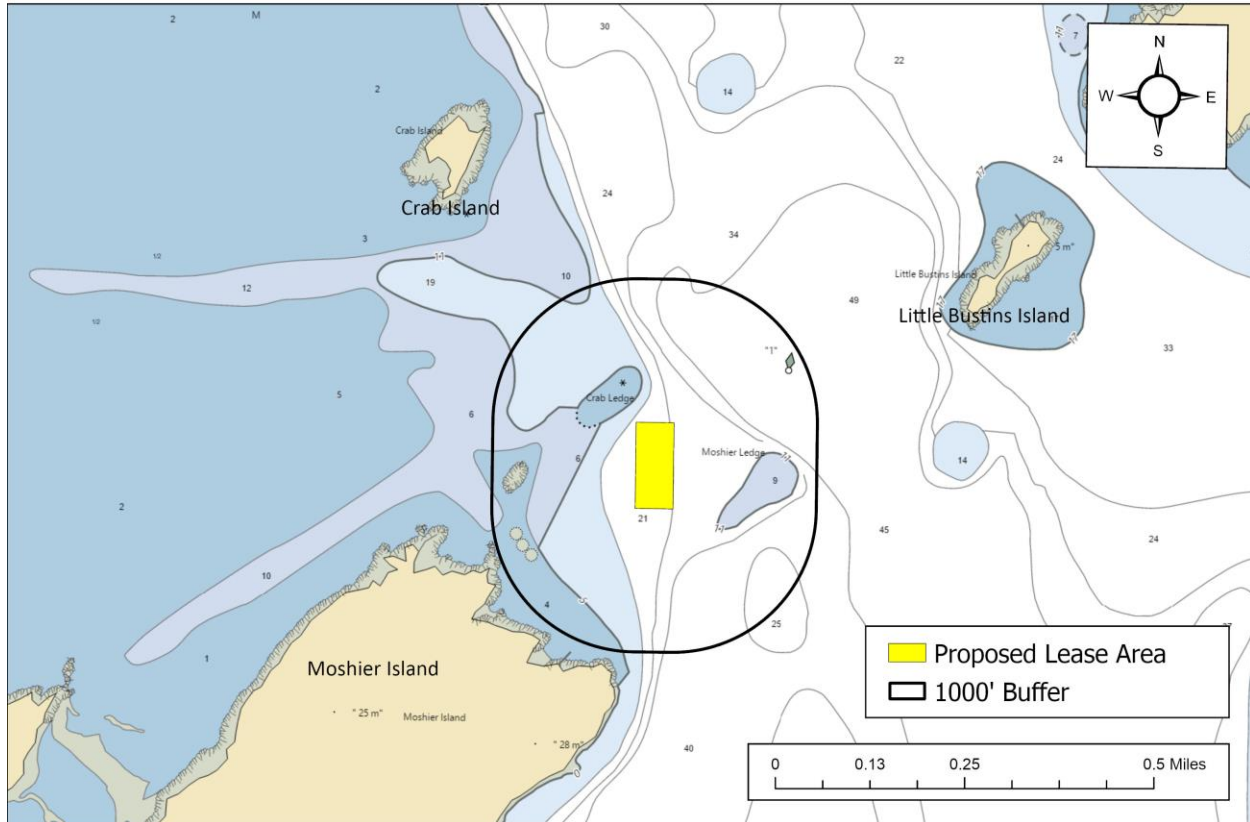


Figure 3. Proposed lease area, 1000' buffer, navigation channels, and channel markers.

(3) Fishing and Other Uses

During the site visit, MDMR documented four lobster buoys outside of the proposal boundaries. The observed lobster buoys were approximately 50 feet, 83 feet, 89 feet, and 330 feet from the proposal boundaries (Figure 2). Additionally, MDMR observed approximately 20 lobster buoys to the north of the proposal.

The local harbormaster stated that this proposal may affect commercial fishing activity in the area. The harbormaster indicated that although most of the commercial fishing occurs during the summer months, leaving mooring gear and tackle in the water during that time of year could affect commercial fishing in the area.⁷

⁷ Harbormaster questionnaire received by MDMR on September 4, 2022.



(4) Other Aquaculture Uses

There is one existing standard aquaculture lease held by Love Point Oysters, LLC (CAS CB) approximately 1,000 feet to the northwest of the proposed lease. There are three limited purpose aquaculture (LPA) lease sites located within the proposal boundaries. All three LPAs, JFOR121, JFOR221, JFOR 321, would be relinquished if this proposal were to be granted⁸ (Figure 4).

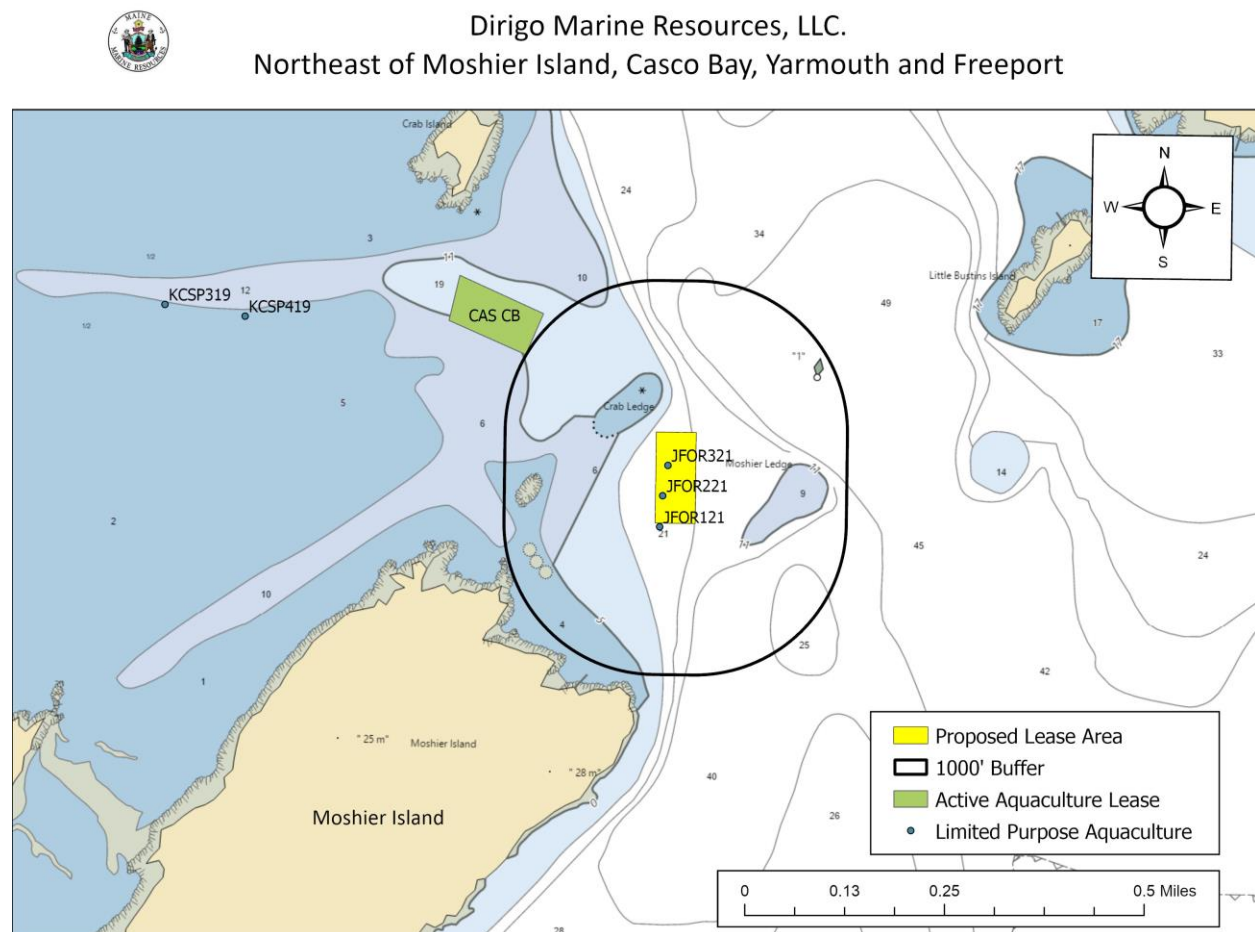


Figure 4. Aquaculture leases LPA licenses in the vicinity of the proposal.

⁸ Application page 8



(5) Existing System Support

Epibenthic Flora and Fauna

On July 19, 2023, MDMR scientists conducted a transect utilizing 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. In the general vicinity of the proposal, there were double-crested cormorants (*Nannopterum auritum*), osprey (*Pandion haliaetus*), bonapartes gulls (*Chroicocephalus philadelphia*), and herring gulls (*Larinae argentatus*).

Table 4. Species observed on underwater footage.

Species Observed	Abundance
Juvenile fish (sp. Unclassified)	Common

Eelgrass (*Zostera marina*)

Data collected by the Maine Department of Environmental Protection (MDEP) and Casco Bay Estuary Partnership (CBEP) in 2022 indicates mapped eelgrass presence in the vicinity of the proposal. The nearest mapped eelgrass is approximately 650 feet west of the proposal (Figure 5).⁹ No eelgrass was observed on underwater camera footage during MDMR's site assessment.

⁹ 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.

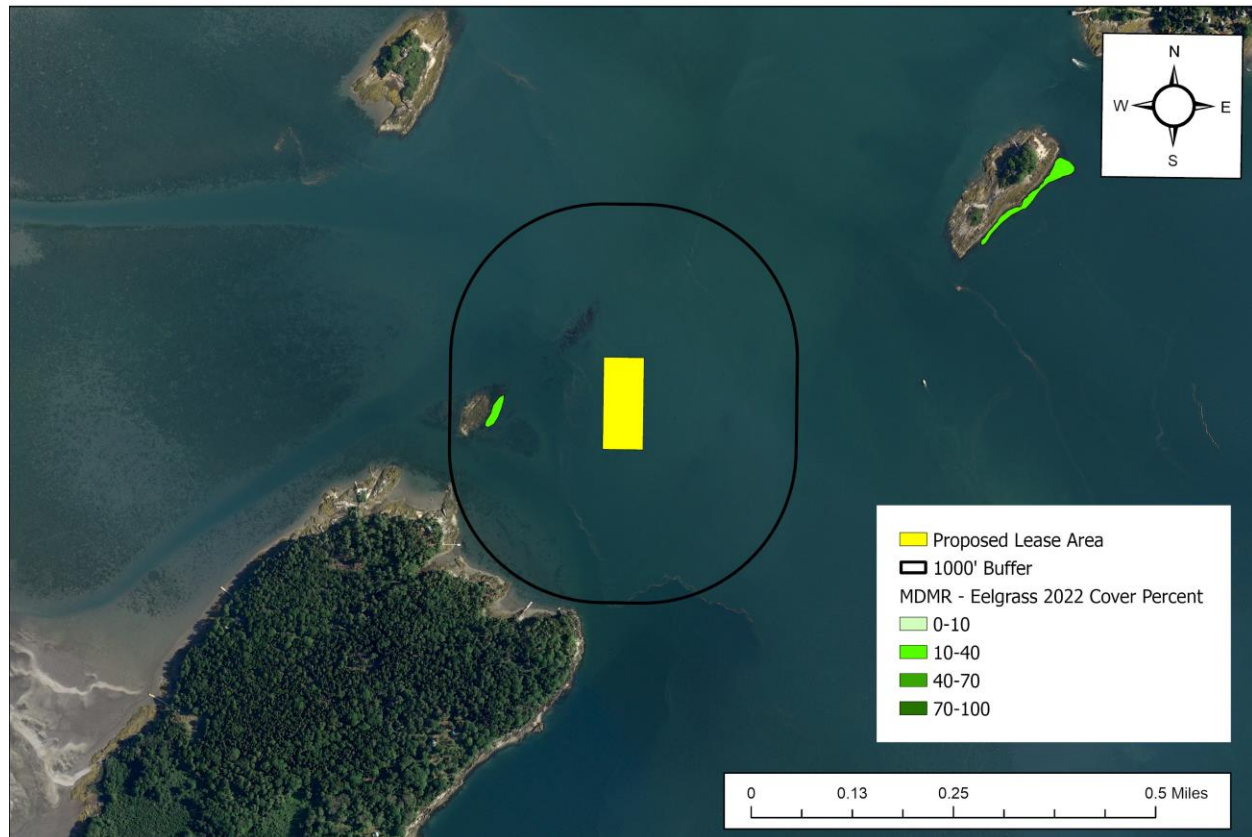


Figure 5. Mapped eelgrass (*Z. marina*) near the proposed lease utilizing 2022 data.

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 3,200 feet to the northeast 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 1.8 miles west of the proposal (Figure 6).

On August 16, 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.¹⁰

¹⁰ Email correspondence between MDIFW and MDMR.



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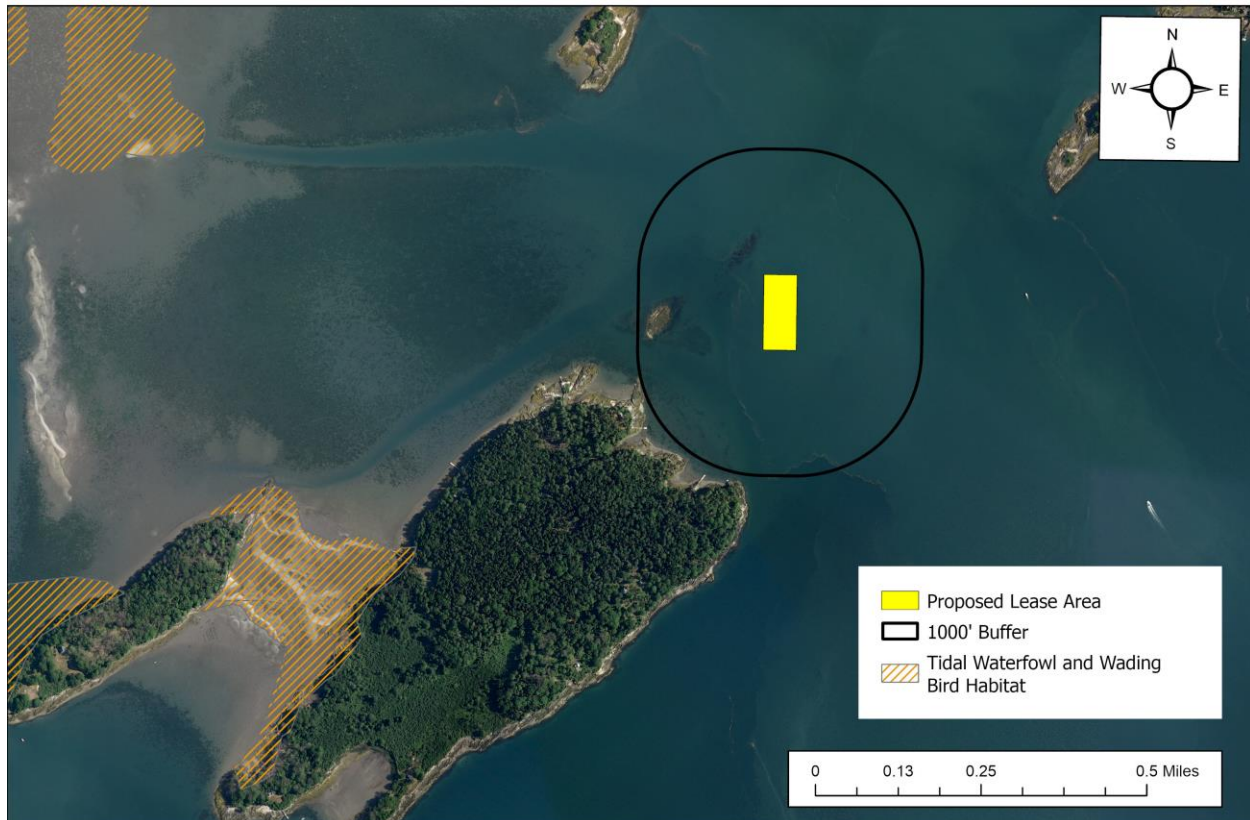


Figure 6. Mapped Tidal Wading Bird and Waterfowl Habitat¹¹.

(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.

¹¹ Data obtained from MDIWF maintained SDE Feature Class “GISVIEW.MEIFW.Twwh”.