

Figure 1. Vicinity map¹

Location: West of Hewett Island, Muscle Ridge Islands, Unorganized Territory in Knox County, Maine

Purpose: Standard lease for suspended culture of marine algae: Sugar Kelp (*Saccharina latissima*), Skinny Kelp (*Saccharina angustissima*), Horsetail Kelp (*Laminaria Digitata*), Winged Kelp (*Alaria esculenta*), Shotgun Kelp/Sea Colander (*Agarum clathratum*)², Dulse (*Palmaria palmata*), Irish moss (*Chondrus crispus*), Nori/Laver (*Porphyra spp.*), *Gracilaria tikvahiae*, and Sea Lettuce (*Ulva lactuca*)

Site Review: Meryl Grady, Geoffrey Shook, Molly Waters

Report Preparation: Geoffrey Shook, 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.

² Application lists the scientific name for "Shotgun Kelp" as *Agarum cribosum*. Accepted species name is *Agarum clathratum*.



Application Overview

The applicants, Robert Baines & Cole Baines, are requesting a 7.19³ acre standard lease for the commercial culture of marine algae west of Hewett Island in the Muscle Ridge Islands. Gear would be on site from November 1 to May 31.⁴ Robert Baines currently operates an experimental lease, PEN CLx, within the boundaries of the proposal (Figure 4). This proposal is larger than existing experimental lease PEN CLx. The applicants are proposing an expansion from 3.74 acres⁵ to 7.19 acres.

General Characteristics

On June 20, 2023, MDMR scientists assessed the proposed lease site from 12:10 PM to 1:20 PM. Underwater video footage was collected by conducting a 290-foot transect line within the proposed lease area using SCUBA (Figure 2). The proposal is located approximately 1,860 feet to the west of Hewett Island at mean high water (MHW) and approximately 4,000 feet to the east of Muscle Ridge Channel. There are no intertidal areas or land within 1,000 feet of the proposal. The surrounding Muscle Ridge Islands are sparsely inhabited with primarily rocky shorelines and forested uplands with areas of low-lying brush and grass.

Depth

On June 20, 2023, MDMR scientists assessed depths at the site beginning at 12:10 PM. The tide was rising with the next high tide predicted at 1:33 PM. Depths were recorded at the proposal corners and determined to be between 39.1 feet and 40.1 feet. Correcting for tidal variations derives depths ranging from 31.6 feet to 32.6 feet at mean low water (MLW, 0.0 feet) and from 40-41 feet at high tide.

Table 1. Tide observations at Port Clyde Station 8415933, St George, Maine.⁶

| Date | Time | Height (ft) |
|-----------|----------|-------------|
| 6/20/2023 | 12:49 AM | 9.8 H |
| 6/20/2023 | 7:22 AM | .1 L |
| 6/20/2023 | 1:33 PM | 8.4 H |
| 6/20/2023 | 7:21 PM | 1.5 L |

³ Applicants originally requested 7.33 acres. MDMR calculations indicate the area is 7.19 acres.

⁴ Application page 11,12

⁵ Experimental Lease PEN CLx Decision History page 1.

⁶ <https://tidesandcurrents.noaa.gov/noaatidepredictions.html?id=8415933>



Bottom Characteristics

MDMR scientists observed the bottom characteristics within the proposed lease site on June 20, 2023, by conducting a video transect using SCUBA. Observed 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). The observed sea floor within the proposal boundaries was composed primarily of soft mud.

Table 2. Bottom characteristics of the proposed site.

| Substrate Origin | Substrate Class | Substrate Subclass | Substrate Group |
|--------------------|----------------------------------|---------------------------------------|-----------------|
| Geologic Substrate | Unconsolidated Mineral Substrate | Fine Unconsolidated Mineral 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) – 7.19 Acres (Figure 2)

| Corner | Latitude | Longitude | | | | | | |
|--------|------------|-------------|------|---------|---------|------|------------|--|
| NW | 43.995167° | -69.081950° | then | 299.5 | feet at | 121° | True to | |
| NE | 43.994733° | -69.080983° | then | 1,060.0 | feet at | 218° | True to | |
| SE | 43.992433° | -69.083450° | then | 298.2 | feet at | 305° | True to | |
| SW | 43.992900° | -69.084367° | then | 1,041.4 | feet at | 42° | True to NW | |

Table 3. Approximate distances from proposed lease to surrounding features (Figures 2 & 3).

| Feature | Distance |
|------------------------------------------------------|-----------------------------------|
| SE corner to Hewett Island, nearest point (~MLW) | ~1,825 feet to the southeast |
| SE corner to Flag Island, nearest point (~MLW) | ~1,330 feet to the southeast |
| NW corner to Clam Ledges, nearest point (~MLW) | ~1,345 feet to the northeast |
| SW corner to Sprucehead Island, nearest point (~MLW) | ~7,040 feet to the west-northwest |
| SW corner to red navigational aid “6” | ~4,775 feet to the west |

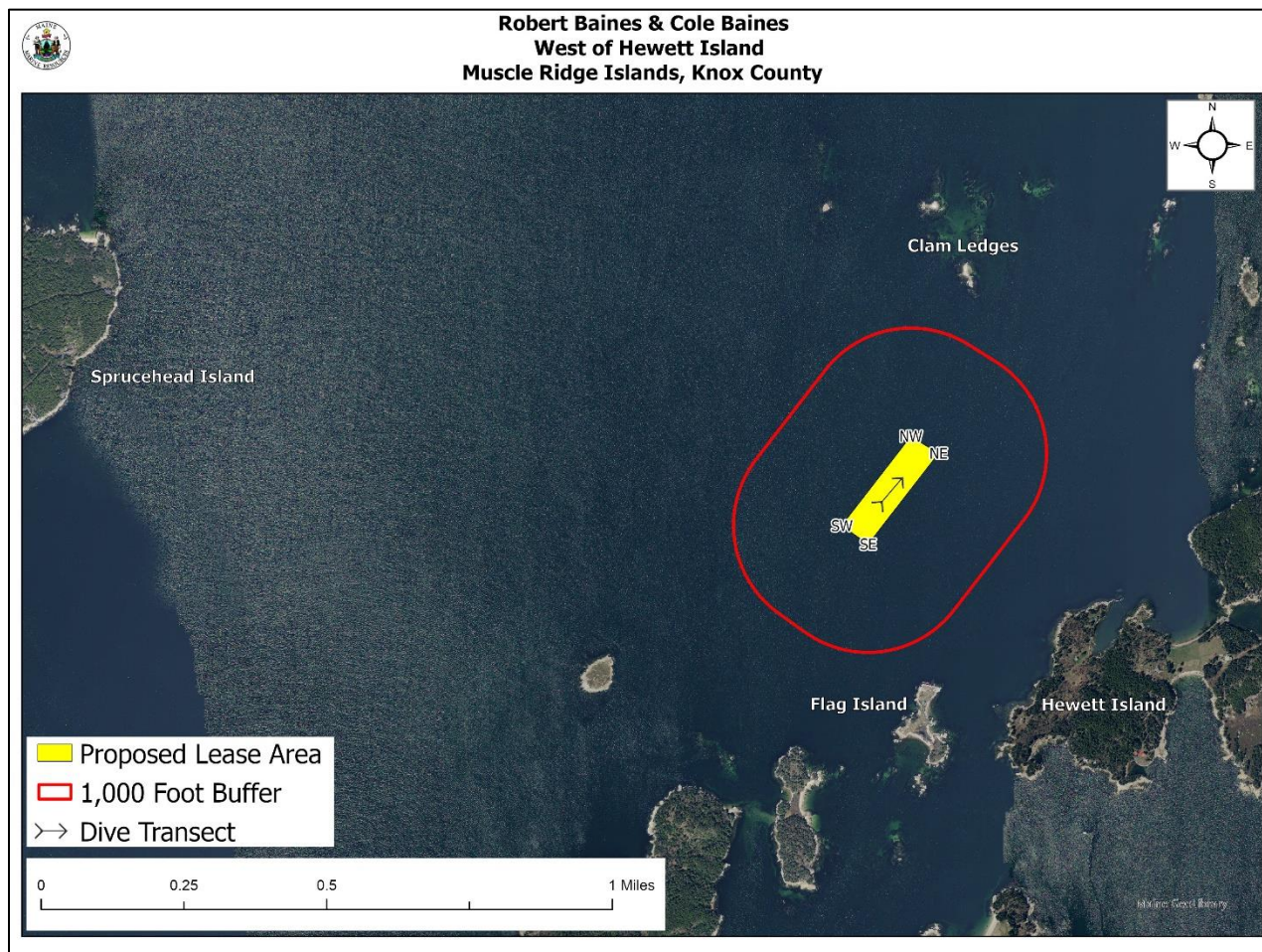


Figure 2. Approximate SCUBA transect and proposed lease corner labels.

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

(1) Riparian Ingress and Egress

The location of the proposal is on the western side of the Muscle Ridge Islands chain. There are no docks or moorings within 1,000 feet of the proposal. The pier observed nearest to the proposal is approximately 1,755 feet to the southeast, on the eastern shore of Flag Island. Hewett Island is inhabited and there were approximately six houses observed on the island in satellite imagery. There were no piers or docks observed on the western side of Hewett Island. The riparian parcels on Hewett Island nearest to the proposal are over 2,000 feet away at MHW and there were no docks or piers observed on the shoreline facing the proposal. There is a small mooring field in a cove on the western side of Hewett Island approximately 2,400 feet to the east of the proposal.



(2) Navigation

The proposal is located approximately 4,150 feet to the east of the Muscle Ridge channel in a partially enclosed area surrounded by the Muscle Ridge Islands. There is over 1,800 feet of navigable water between the proposal and Hewett Island at MLW, over 1,300 feet of navigable water between the proposal and Clam Ledges at MLW and over 1,300 feet of navigable water between the the proposal and Flag Island (Figure 3).

During MDMR's site assessment conducted on June 20, 2023, scientists observed several boats transiting to the south of the proposal between Bar and Flag Islands. Scientists also observed a lobster boat transiting through the proposed lease area.

A Harbormaster Questionnaire was completed by the local Marine Patrol Officer (MPO) and submitted to the MDMR Aquaculture Division on January 6, 2022. The MPO indicated that the proposal should not affect navigation or anchoring in the area.

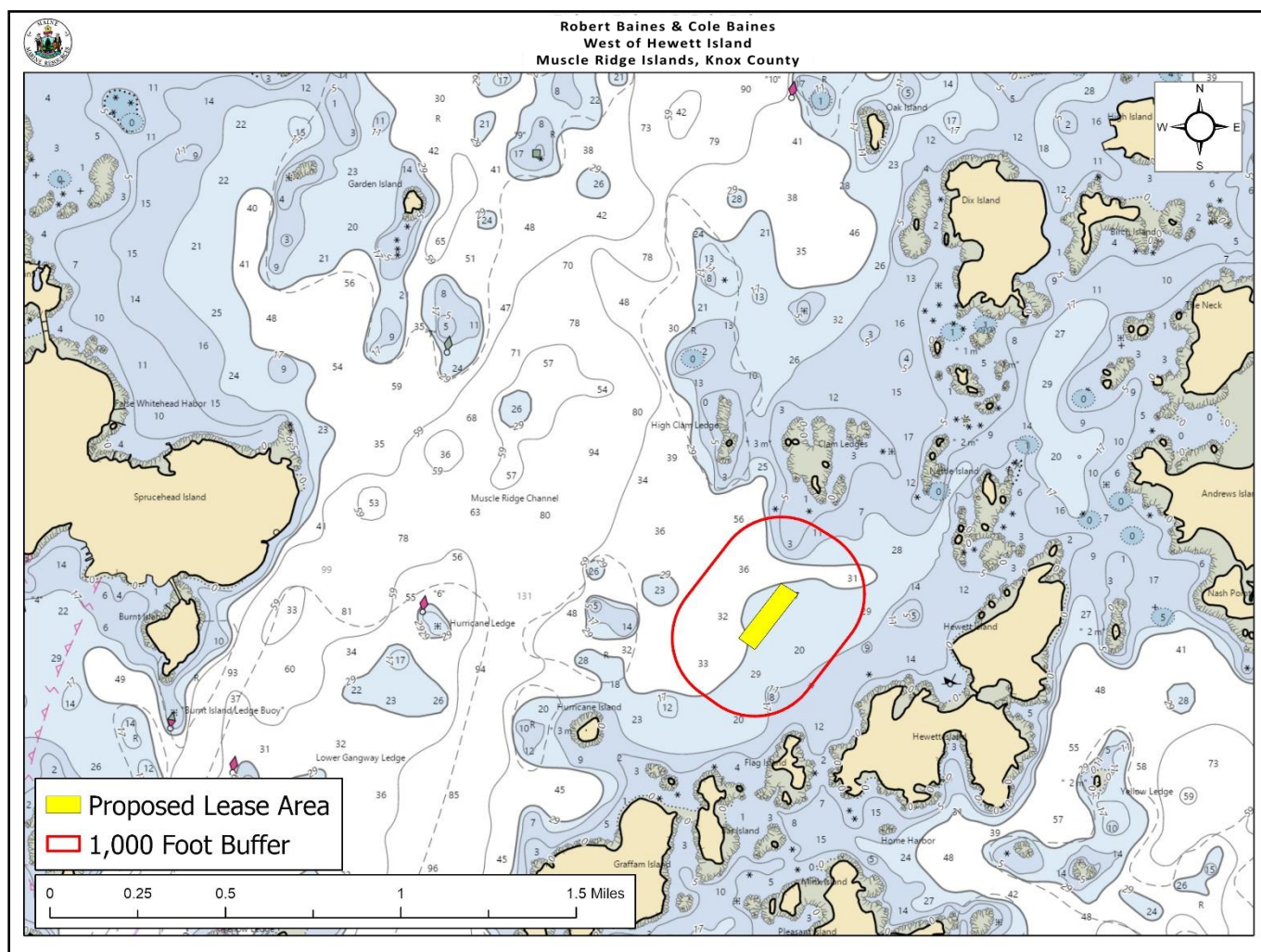


Figure 3. Surrounding features, navigation channels and channel markers.



(3) Fishing and Other Uses

During MDMR's site assessment on June 20, 2023, no commercial fishing activity was observed within the boundaries of the proposed lease. A lobster boat was observed transiting through the proposed lease area but was not observed working any gear in the vicinity.

A Harbormaster Questionnaire was completed by the local Marine Patrol Officer (MPO) and submitted to the MDMR Aquaculture Division on January 6, 2022. The MPO indicated that they have not observed any commercial or recreational fishing within the proposed lease area.

(4) Other Aquaculture Uses

The applicant currently operates a 3.74-acre experimental lease, PEN CLx, within the boundaries of this proposal. The standard lease proposal is intended to replace PEN CLx. There are no other active leases or LPAs within 1,000 feet of the proposal (Figure 4).

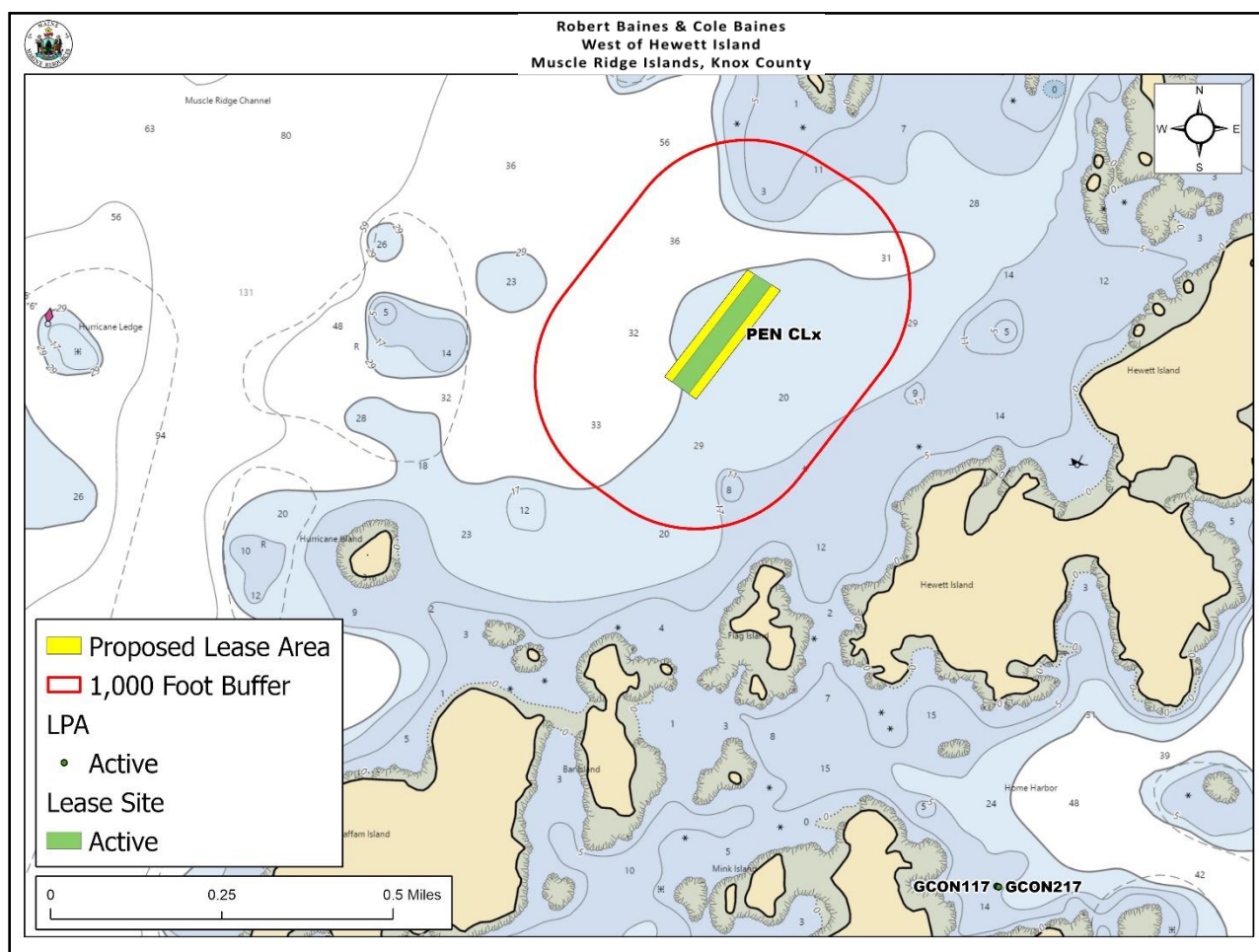


Figure 4. Aquaculture leases and Limited Purpose Aquaculture (LPA) licenses in the general area of the proposal.



(5) Existing System Support

Epibenthic Flora and Fauna

During the site assessment on Jun 20, 2023, MDMR scientists conducted a SCUBA transect to collect underwater video footage and assess the epibenthic ecology of the area (Figure 2). Numerous lobster burrows were observed and occasionally lobsters (*Homarus americanus*) were observed within the burrows (Image 1). Sugar Kelp (*Saccharina latissima*) holdfasts and stipes were observed in the sediment without blades attached, as well as organisms with the blade attached. In addition to epibenthic flora and fauna, lion's mane jellyfish (*Cyanea capillata*) were observed in the water prior to the SCUBA dive. The relative abundance of epibenthic flora and fauna observed in the video transect is described below in Table 4.



Image 1. Lobster (*Homarus americanus*) observed in a burrow.

Table 4. Species observed on underwater footage collected by MDMR.

| Species Observed | Abundance |
|-----------------------------------------------|------------|
| Hermit Crab (<i>Paguroidea</i> spp) | Rare |
| Sea raven (<i>Hemitripterus americanus</i>) | Rare |
| Sugar Kelp (<i>Saccharina latissima</i>) | Occasional |
| Lobster (<i>Homarus americanus</i>) | Common |
| Crab (<i>Cancer</i> sp.) | Common |



Eelgrass (*Zostera marina*)

According to data collected in 2010, there is no eelgrass (*Z. marina*) located within 1,000 feet of the proposal. In 2010, eelgrass was observed approximately 1,475 feet to the southeast of the proposal (Figure 5). During the site visit conducted on June 20, 2023, MDMR scientists did not observe any eelgrass.

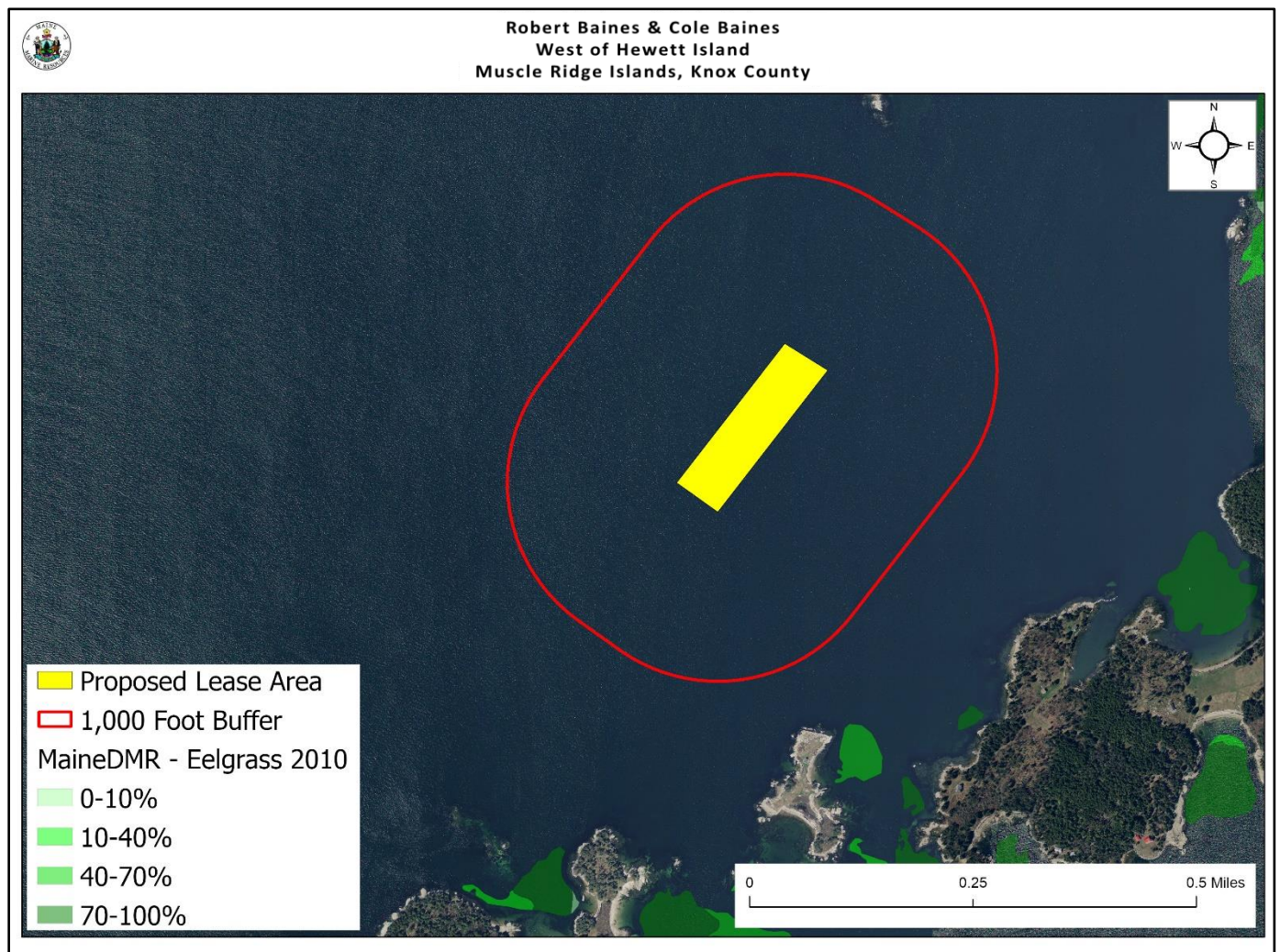


Figure 5. Historical eelgrass (*Z. marina*) near the proposed lease site utilizing data from 2010⁷.

⁷ 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.



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, the proposed lease area is not located within tidal waterfowl and wading bird habit (Figure 6). 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 1.7 miles to the northeast of the proposal.

During the site assessment conducted on June 20, 2023, MDMR scientists observed black guillemots (*Cepphus grylle*), gulls (*Larus sp.*), as well as occasional common terns (*Sterna hirundo*). A bald eagle (*Haliaeetus leucocephalus*) was also observed flying in the vicinity of the proposal. Harbor seals (*Phoca vitulina*) were common in the vicinity of proposed lease area.

On January 14, 2022, a Wildlife Biologist with MDIFW responded by email to a “Request for Agency Review and Comment”, stating that minimal impacts to wildlife are anticipated.⁸

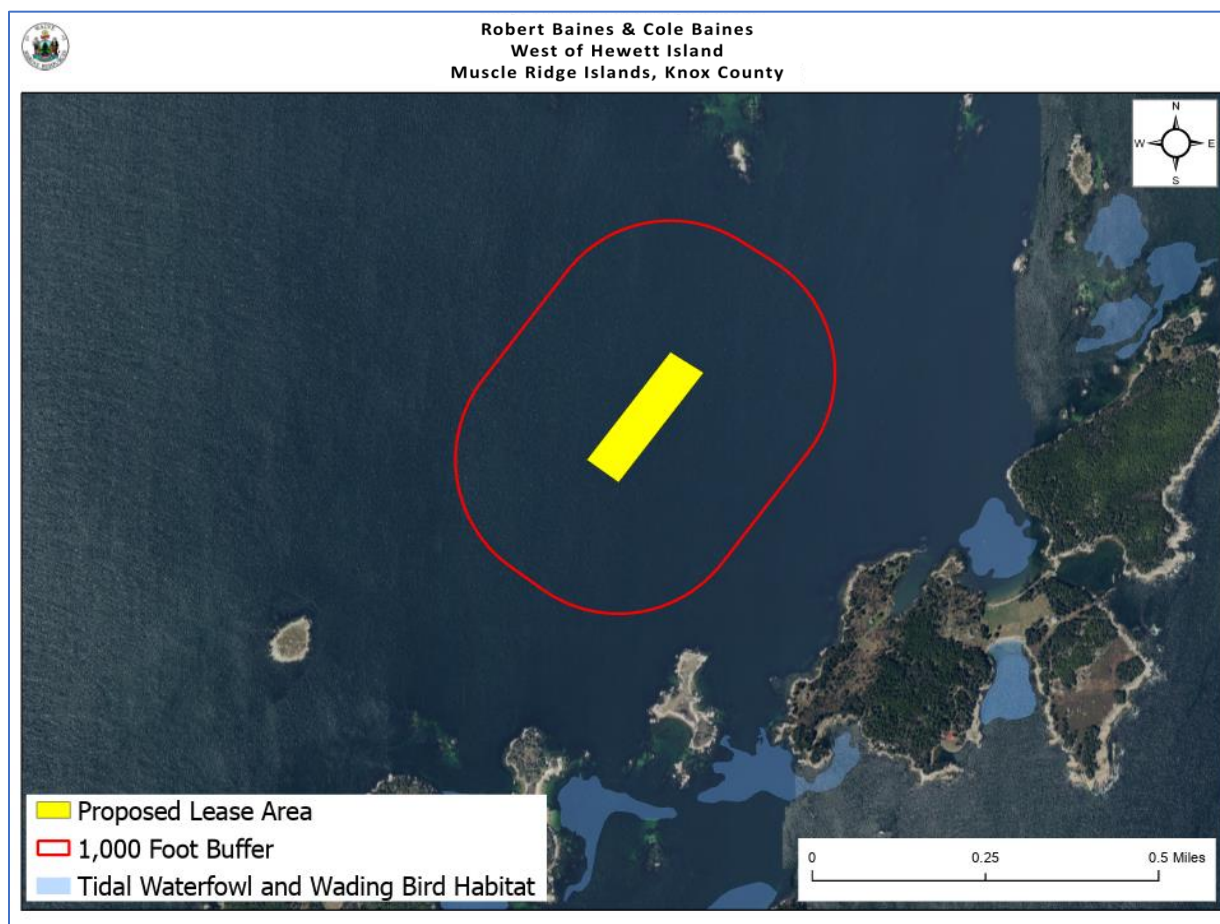


Figure 6. Tidal waterfowl and wading bird habitat.⁹

⁸ Email correspondence between MDIFW and MDMR

⁹ Data obtained from MDIWF maintained SDE Feature Class “GISVIEW.MEIFW.Twwh”, USFWS maintained SDE Feature Class “Bald Eagle Nests-330’ & 660’ Buffers”



(6) Interference with Public Facilities

There are no federal, state, or municipally owned or conserved lands within 1,000 feet of the proposal (Figure 7).

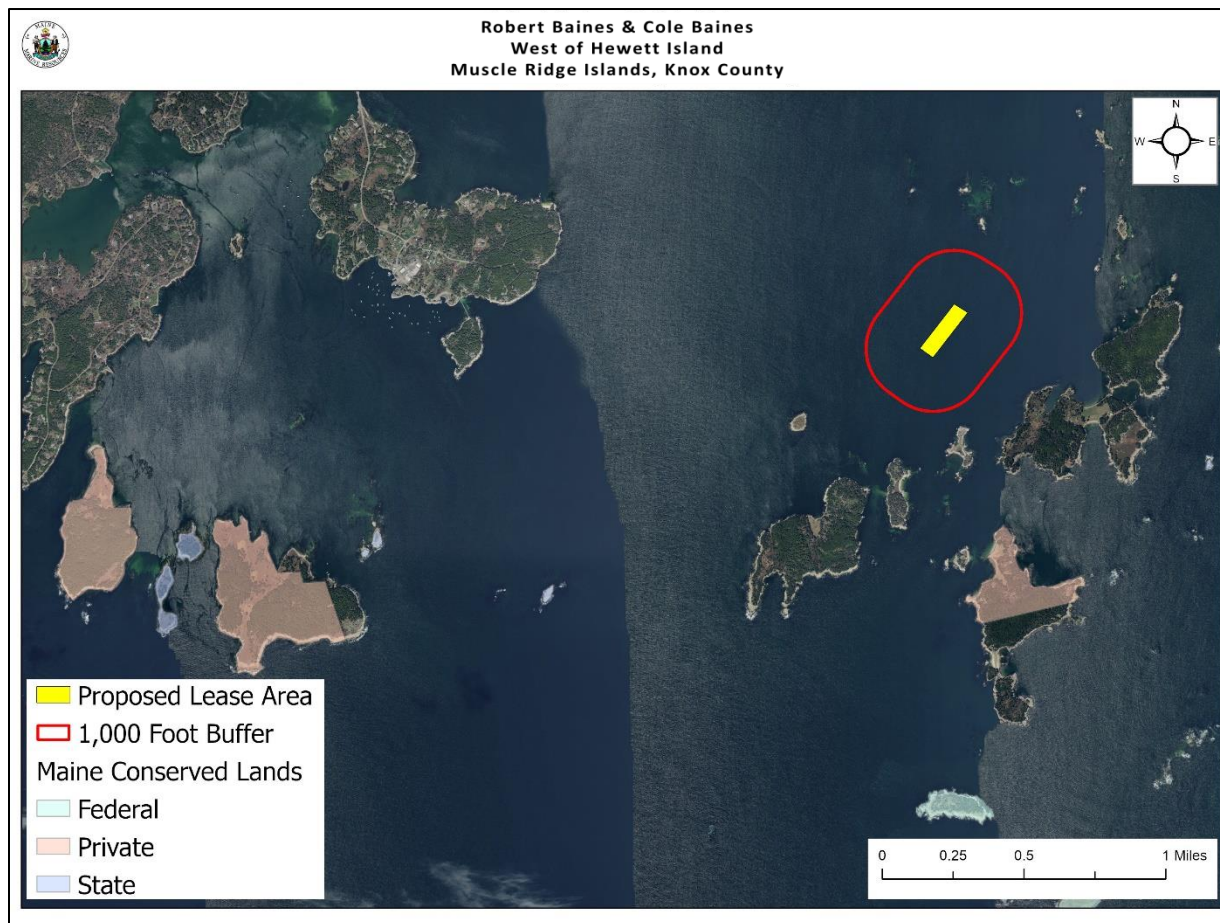


Figure 7. Public facilities near the proposed lease site.¹⁰

(7) Water Quality

The proposed lease is in an area currently classified as Approved by the MDMR Bureau of Public Health.

¹⁰ Data obtained from SDE Feature Class sourced from The Maine Office of GIS "GISVIEW.MECONSLANDS.Conserved_Lands"