Shannon Harvey - Southeast of Cow Island, Bremen

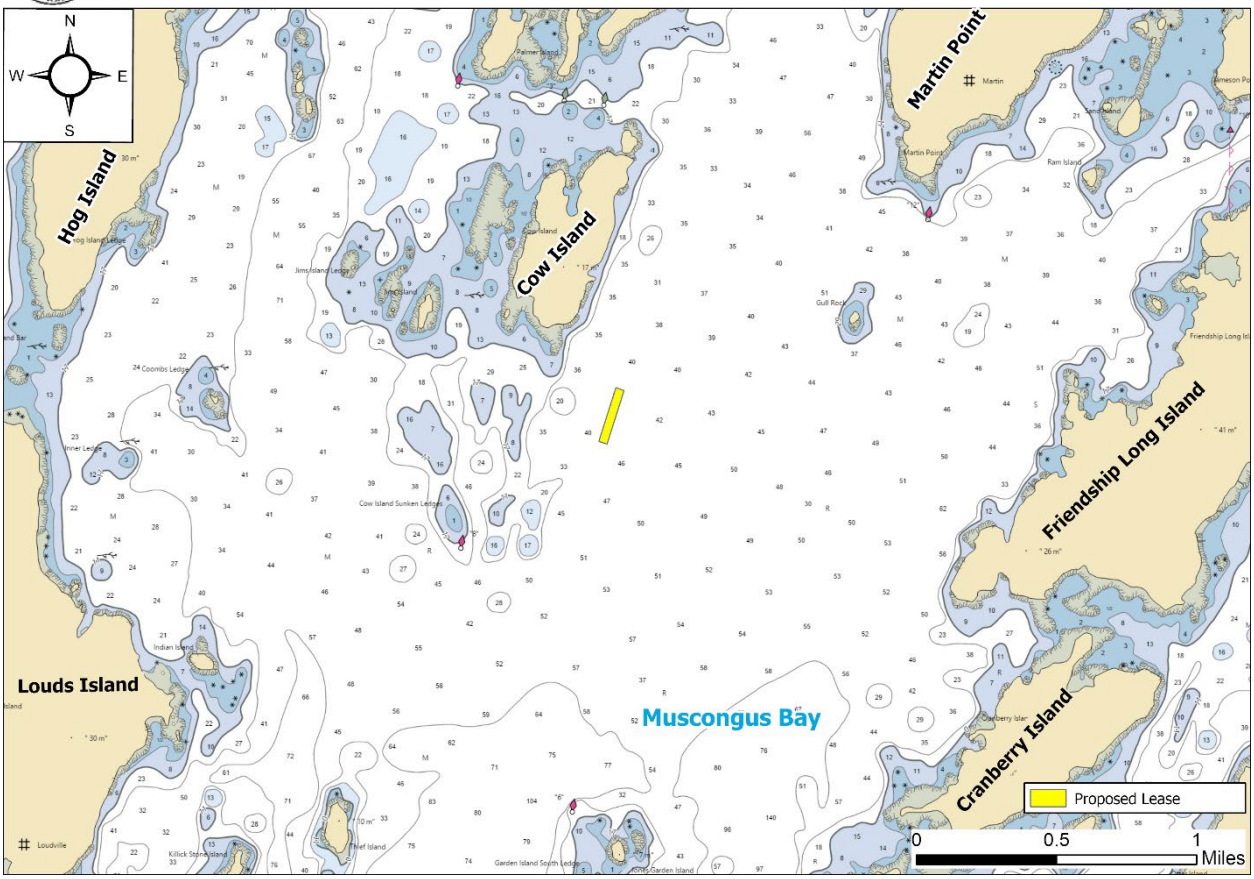


Figure 1. Vicinity map.[1]

Location: Southeast of Cow Island, Muscongus Bay, Bremen, Lincoln County, Maine

Purpose: Experimental lease for suspended culture of sugar kelp (*Saccharina latissima*), skinny kelp (*Saccharina angustissima*), winged kelp (*Alaria esculenta*), horsetail kelp (*Laminaria digitata*), shotgun kelp (*Agarum clathratum*), dulse (*Palmaria palmata*), sea lettuce (*Ulva lactuca*), and Irish moss (*Chondrus crispus*).

Site Review: Geoff Shook and Katie von Hohenleiten
Report Preparation: Katie von Hohenleiten, Geoff Shook, and Meryl Grady

[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, Shannon Harvey, is requesting a 3.96[2] acre experimental lease southeast of Cow Island in Muscongus Bay for the suspended culture of marine algae. The applicant intends to remove all gear, except mooring blocks, chain, and lines, from June 2 through October 31. Mooring chains and mooring lines will be sunk to the bottom of the proposal during the off season. [3] The applicant has requested an exception to Maine Department of Marine Resources (MDMR) regulations Chapter 2.80 which requires, in part, the lease to be marked by yellow buoys year-round. The applicant states the lease would be marked accordingly while the farm is active from November 1 through June 1. In the off season from June 2 through October 31, the site would be unmarked to limit the potential for interference with fishing gear. [4]

General Characteristics

On August 15, 2024, MDMR scientists assessed the proposed lease site. MDMR scientists arrived on site at approximately 11:58 AM. The eastern shore of Cow Island, in the vicinity of the proposal, consists of rocky coastline leading to coniferous uplands.

Depth

MDMR scientists began collecting depths at the proposed site at approximately 12:00 PM. Measured depths at corners of the proposed lease site ranged from 44.4 to 49.0 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 41.8 to 46.4 feet (Table 1).

Table 1. Predicted tidal heights in Friendship, Maine.[5]

Date	Time	Height (ft)
2024/08/15	1:23 AM	1.4 L
2024/08/15	7:31 AM	7.5 H
2024/08/15	1:25 PM	1.9 L
2024/08/15	7:41 PM	9.1 H

Bottom Characteristics

MDMR scientists observed the bottom characteristics of the proposed lease site via a remotely operated vehicle (ROV). 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 4.0 acres. MDMR calculations indicate the area is 3.96 acres.
[3] Application pages 9, 16, and 17
[4] Application page 17
[5] https://www.usharbors.com/harbor/maine/friendship-harbor-me/tides/?tide=2024-08#monthly-tide-chart

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, a nautical chart provided by the National Oceanic and Atmospheric Administration (NOAA), and the application coordinates (Table 3, Figure 3).

Application Coordinates (WGS84) – 3.96 Acres

Corner	Latitude	Longitude	
NW	43.95394°	-69.38863°	then 162.2 feet at 108° True to
NE	43.95379°	-69.38805°	then 1,058.1 feet at 198° True to
SE	43.95102°	-69.38925°	then 163.6 feet at 287° True to
SW	43.95116°	-69.38984°	then 1,062.3 feet at 017° True to NW

Table 3. Approximate distances from proposal to surrounding features (Figures 2 and 3).

Feature	Distance
NW corner to Cow Island at MLW	~1,284.0’ to the northwest
NW corner to nearest Cow Island Sunken Ledge	~1,610.7’ to the southwest
NE corner to Cow Island at MLW	~1,450.2’ to the northwest
NE corner to red nun navigation buoy “12”	~6,575.9’ to the northeast
NE corner to Gull Rock at MLW	~4,403.5’ to the northeast
SE corner to Gull Rock at MLW	~5,072.2’ to the northeast
SE corner to Friendship Long Island at MLW	~6,920.3’ to the southeast
SE corner to red nun navigation buoy “8”	~3,367.5’ to the southwest
SW corner to red nun navigation buoy “8”	~3,286.9' to the southwest
SW corner to nearest Cow Island Sunken Ledge	~1,480.4’ to the west
SW corner to Cow Island at MLW	~1,817.6’ to the northwest

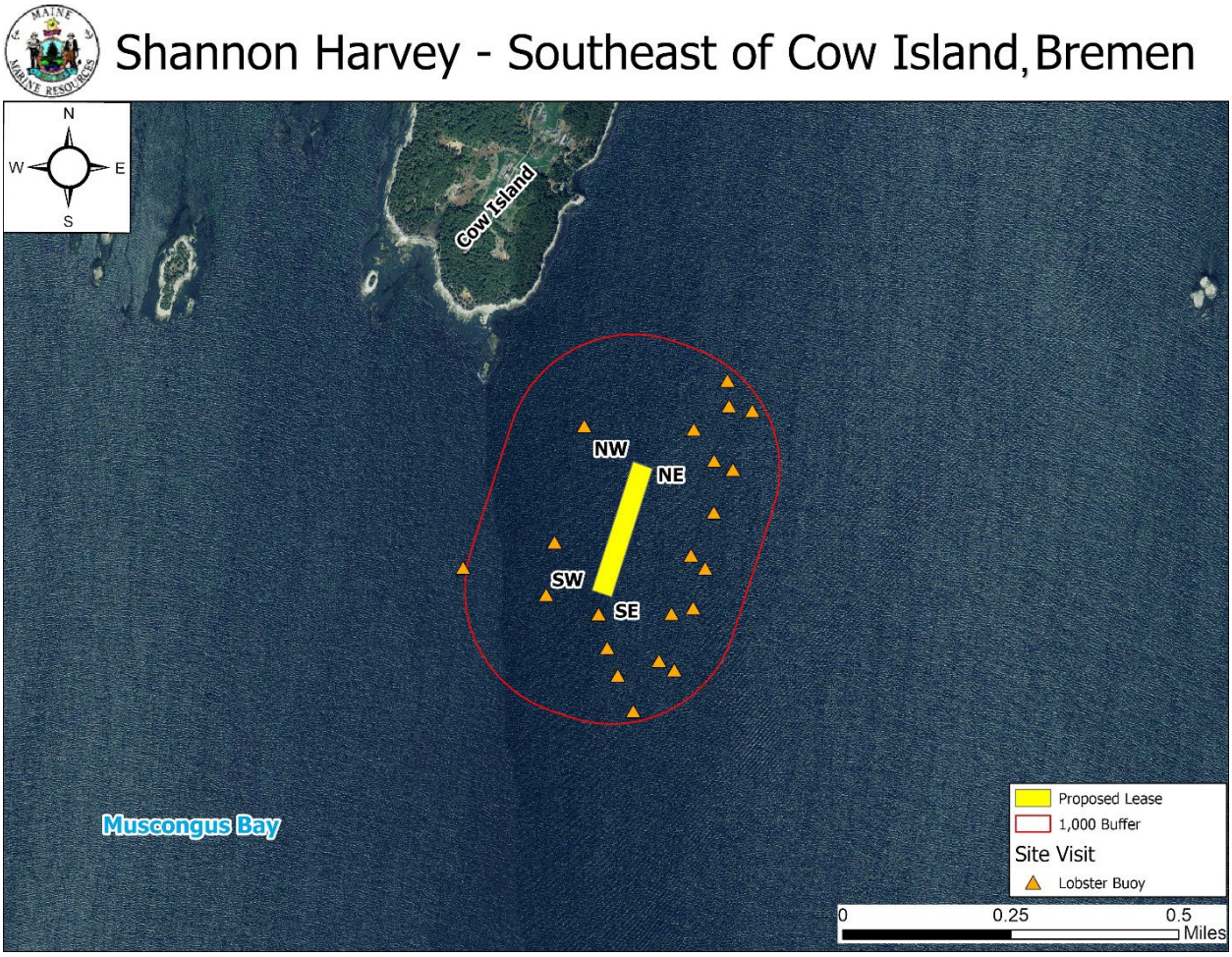


Figure 2. Proposed lease area with site visit observations.

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 did not observe any docks, houses, or moorings in the vicinity of the proposal. The land nearest to the proposal is Cow Island located 1,284.0 feet northwest at MLW. Cow Island is held in a conservation easement by Maine Coast Heritage Trust. Aerial imagery[6] indicates a dock on the northwest side of Cow Island approximately 4,137.5 feet from the proposal. No docks or other structures were observed on the eastern shoreline of Cow Island at the time of the site visit.

A Harbormaster Questionnaire was sent to the Town of Bremen. MDMR did not receive a response.

[6] Maine Orthoimagery Coastal Midcoast 2023

(2) Navigation

The proposal is located approximately 1,284.0 feet southeast of Cow Island at MLW. There is approximately 6,920.3 feet of navigable water between the proposal and the shore of Friendship Long Island at MLW. There are two entrances to the Medomak River, which is located north of the proposal. There is one unmarked, navigable waterway to the east of Cow Island and Bremen Long Island and one marked channel to the west of Cow Island and Bremen Long Island. Red navigational buoy "12" marks the channel to and from Friendship Harbor (Figure 3). Friendship Harbor is 2.6 miles northeast of the proposal.

During the site visit, a small, motorized skiff was observed transiting through the proposed site, and a sailboat under sail was observed to the east of the proposal.

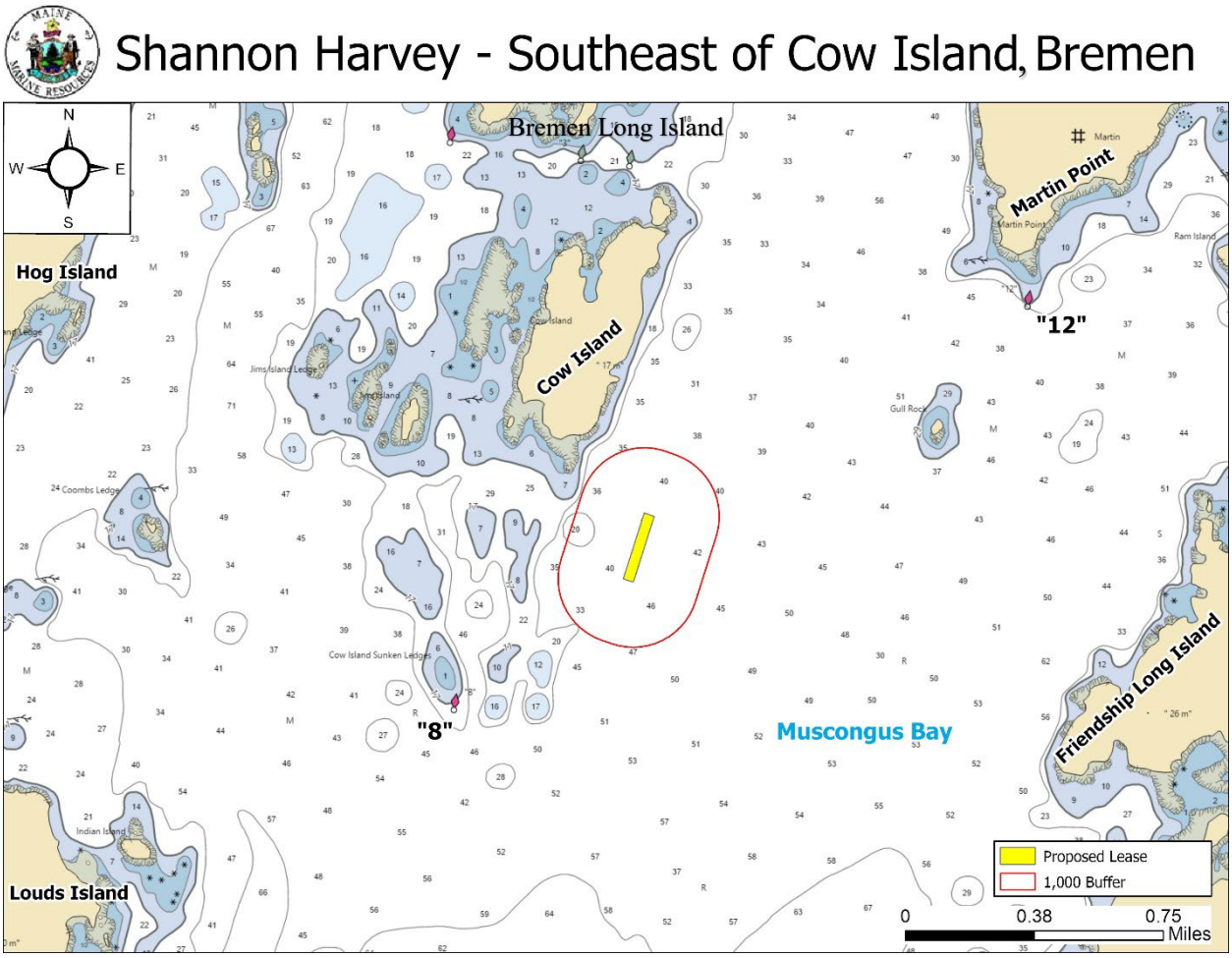


Figure 3. Navigational channels in the vicinity of the proposed lease area.

(3) Fishing and Other Uses

During the site visit, MDMR documented 20 lobster buoys within 1,000 feet of the proposal. The closest buoy was located approximately 155.5 feet south of the proposal (Figure 2).

During the site visit, MDMR observed three commercial fishing vessels actively hauling lobster fishing gear south of the proposal.

(4) Other Aquaculture Uses

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

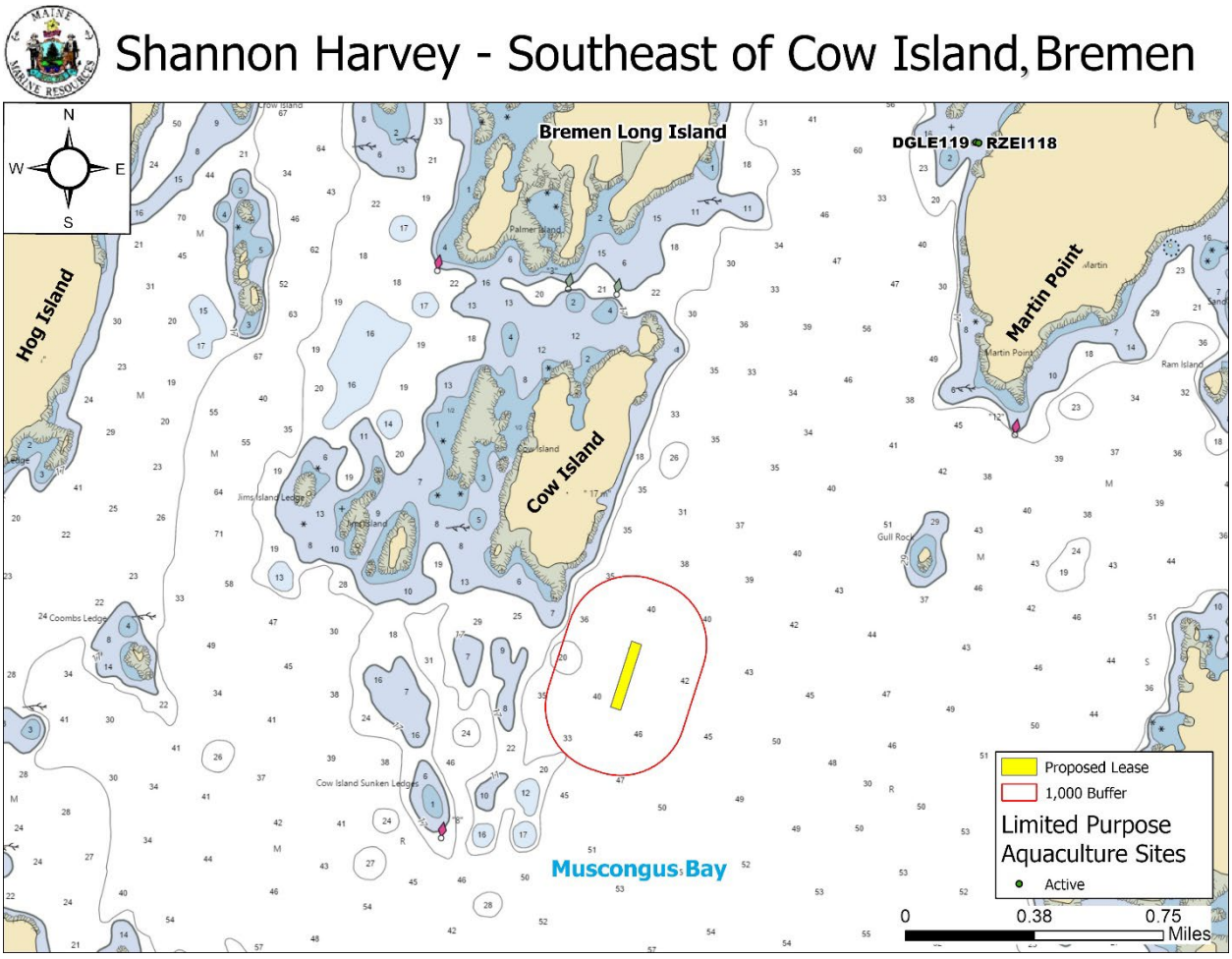


Figure 4. Aquaculture leases and LPA licenses in the vicinity of the proposed lease area.

(5) Existing System Support

Epibenthic Flora and Fauna

On August 15, 2024, MDMR scientists utilized an ROV to assess the epibenthic ecology of the proposed lease. The relative abundance of epibenthic flora and fauna observed in the video footage is described below in Table 4.

Table 4. Species observed on underwater camera footage.

Species Observed	Abundance
Mysid Shrimp (*mysis sp*.)	Abundant
American Lobster (*Homarus americanus*)	Occasional

Eelgrass (*Zostera marina*)

Recent records of eelgrass collected by the Maine Department of Environmental Protection (MDEP) in 2023[7] indicate no mapped eelgrass presence in the vicinity of the proposal. The nearest mapped eelgrass is approximately 1,433.7 feet northwest of the proposal (Figure 5).

During the site visit, eelgrass blades were observed drifting on the surface of the water in the vicinity of the proposal. Additionally, a single blade of very unhealthy eelgrass attached to the seafloor was observed on underwater camera footage within the proposal boundaries during MDMR's site assessment (Image 1). Water depth in this general area is approximately 41.8 to 46.4 feet at MLW.

Eelgrass is typically found in shallower water depths in subtidal to low intertidal areas to allow for adequate light penetration. The underwater camera footage shows very little light penetration to the seafloor at the time of the site visit. MDMR expects seasonal regrowth of eelgrass to occur in April/May and seasonal senescence of eelgrass to occur in October/November. The applicant is proposing to seasonally culture marine algae on longlines from November to June.

[7] Data obtained from The Maine Office of GIS "GISVIEW.MEDEP.Seagrass2023". Widgeon grass was observed only in a tributary to the Great Salt Bay, upstream of a culvert that likely restricts tidal flow. Eelgrass was the dominant vascular species in all other locations. This is the most current record of mapped eelgrass within the vicinity of the proposal.

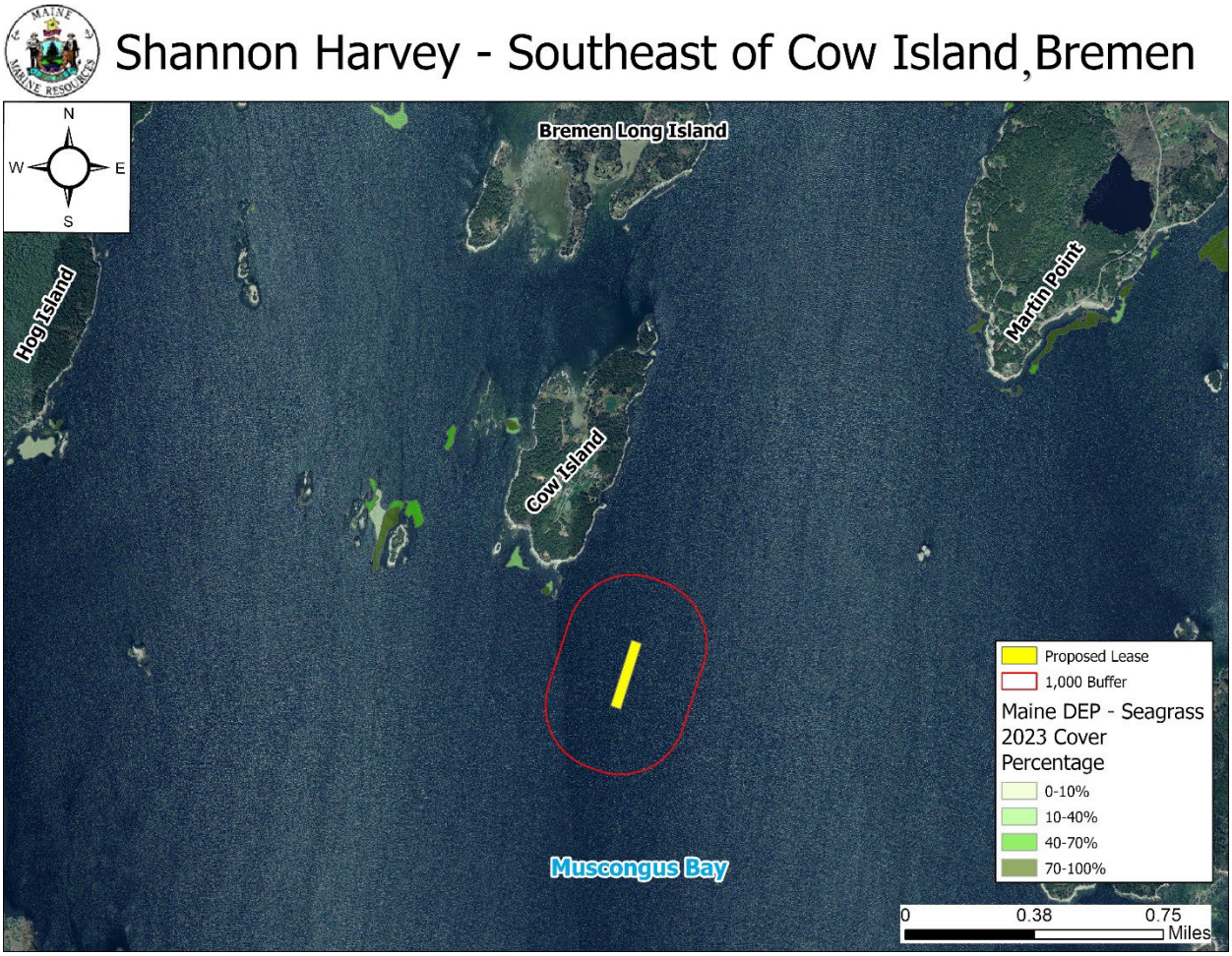
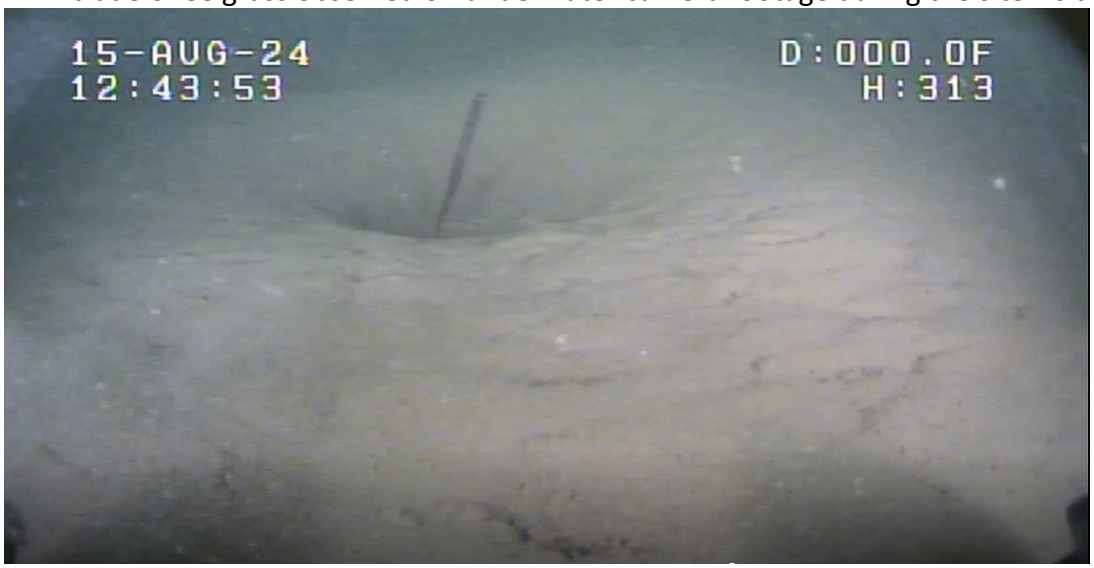


Figure 5. Mapped eelgrass (*Z. marina*) in the vicinity of the proposed lease area.

Image 1. A blade of eelgrass observed on underwater camera footage during the site visit.



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 2,736.5 feet southeast of mapped Tidal Waterfowl and Wading Bird Habitat (TWWH). 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 0.74 miles northwest of the proposal (Figure 6). On September 20, 2023, a Resource Biologist with MDIFW responded by email to a "Request for Agency Review and Comment" stating minimal impacts to wildlife are anticipated for this project.[8]

During the site assessment, MDMR scientists observed black guillemot (*Cepphus grylle*), osprey (*Pandion haliaetus*), and harbor seals (*Phoca vitulina*) in the general vicinity of the proposal.

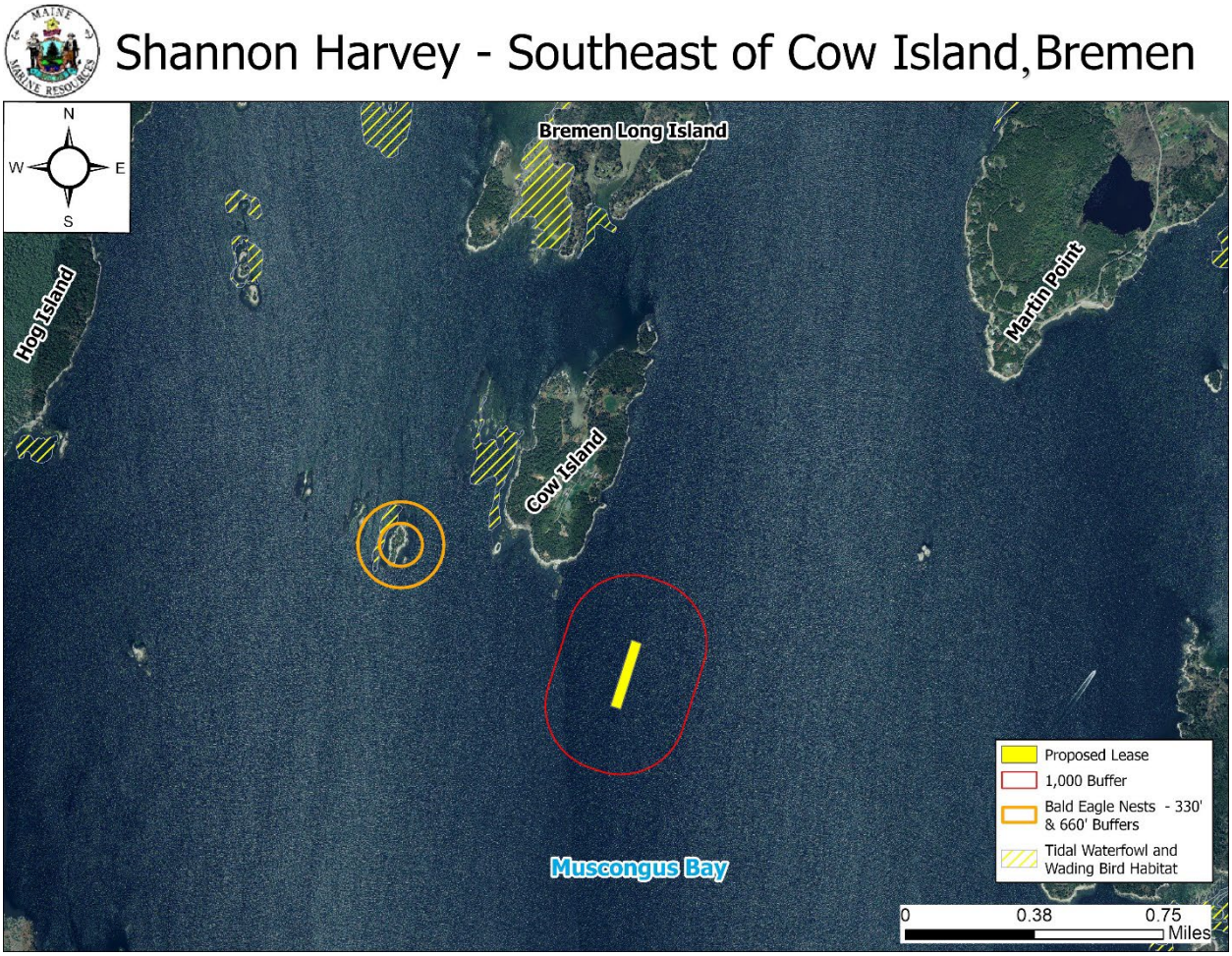


Figure 6. Mapped bald eagle nests and TWWH. [9]

[8] Email correspondence between MDIFW and MDMR

[9] Data obtained from USFWS "Bald_Eagle_Nests_-_Maine_2023" and MDIFW maintained SDE Feature Class "GISVIEW.MEIFW.Twwh"

(6) Interference with Public Facilities

The proposed lease is not 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 Approved by the MDMR Bureau of Public Health and Aquaculture.