

Figure 1: Vicinity map¹

Location: Application 2, ~1,00 feet north of Lower Basket Ledge, Casco Bay, Chebeague Island, Cumberland County, Maine

Purpose: Experimental lease for the suspended culture of sugar kelp (*Saccharina latissima*) and skinny kelp (*Saccharina angustissima*)

Site Review by: Flora Drury and Cheyenne Adams

Report Preparation by: Cheyenne Adams and Geoffrey Shook

Report Completed: November 8, 2022

¹All 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 (orthoCoastalCascoBay2018).

Application Overview

The applicant is requesting 3.87² acres ~300 feet north of Lower Basket Ledge in Casco Bay, in the Town of Chebeague Island, for the suspended culture of marine algae.³ From November 1 to June 1, the applicant is requesting to culture kelp on 300-foot horizontal longlines suspended approximately 7 feet below the surface of the water⁴. During the summer months, only (24) mooring blocks connected with chain, (4) mooring lines, and (4) mooring buoys would remain on the lease site.⁵ In accordance with MDMR Regulations, Chapter 2.80, these corner mooring buoys would need to meet the marking requirements for a lease site, or else additional marker buoys would be required. Each kelp longline would support (9) depth-control buoys and (9) 6"x6" cement weight, for a total of 207 buoys and 207 weights across the 23 proposed longlines during winter months.⁶ The applicant proposes a 20-foot gap between the deployed longlines.⁷

General Characteristics

On April 4, 2022, MDMR staff Flora Drury and Cheyenne Adams visited the proposed experimental aquaculture lease. MDMR staff arrived on site at 1:00 pm; the tide was in the flood stage.

The proposed lease occupies subtidal waters north of Lower Basket Ledge, between Great Chebeague and Basket Islands in Casco Bay (Figure 1). Cousins Island is to north and features a power plant with forested and residential uplands. Basket Island, to the west of the proposal, exhibits a rocky shoreline and an aquaculture lease off its eastern shore (Images 1 & 2). To the southwest is Clapboard Island, which is forested and residential (Images 2 & 3). Lower Basket Ledge is a natural navigational hazard to the south of the proposal, which is marked by a green navigational beacon (Image 3). Great Chebeague and Little Chebeague Islands are to the east and southeast, respectively (Images 4 & 5).

² Applicant originally requested 4.00 acres. MDMR calculations, based on the provided coordinates, indicate the area is 3.87 acres.

³ Application page 1

⁴ Application, pages 20, 24 & 30

⁵ Application, pages 5 & 12

⁶ Application, pages 12 & 20

⁷ Application, page 20



Image 1: Facing northwest toward Basket Island and the mainland shoreline from near the proposed SE corner (April 4, 2022).



Image 2: Facing west toward Basket Island (right) and Clapboard Island (left) and the mainland shoreline (background) from near the proposed SE corner (April 4, 2022).



Image 3: Facing southwest toward Clapboard Island (right), Lower Basket Ledge (left), and other Casco Bay Islands (background) from near the proposed SE corner (April 4, 2022).



Image 4: Facing southeast toward Lower Basket Ledge (right) and Little Chebeague Island (center) from near the proposed SE corner (April 4, 2022).



Image 5: Facing east toward Great Chebeague Island from near the proposed SE corner (April 4, 2022).

Depth

At the time of MDMR’s site assessment, depths at the corners of the proposed lease site ranged from 30.4 feet to 30.5 feet, as measured with a transom-mounted depth sounder. MDMR staff observed the depths of the proposed lease site at approximately 1:00 pm. Correcting for tidal variation derives water depths 0.9 feet higher at the nearest high water (31.3 feet to 31.4 feet) and 8.2 feet lower (22.2 feet to 22.3) at mean low water (MLW, 0.0 feet).

Table 1: Tide predictions at Falmouth Foreside, Casco Bay, Maine (43.7317° N, 70.2050° W)⁸

Date	Time	Height (ft.)
4/4/2022	8:04 AM	-0.19 L
4/4/2022	2:17 PM	9.13 H
4/4/2022	8:13 PM	0.75 L

Bottom Characteristics

Bottom characteristics were categorized using the Coastal and Marine Ecological Classification Standard (CMECS), a national standard for describing features of the marine environment. Sediment information was determined based on visual analysis of the video; no sediment samples were taken or grain size analysis performed. The substrate types observed during the drop camera transect are included in Table 2 and shown in Image 6.

⁸ <http://tbone.biol.sc.edu/tide/tideshow.cgi>

Table 2: Bottom characteristics of proposed site.

Substrate Origin	Substrate Class	Substrate Subclass	Substrate Group
Geologic Substrate	Unconsolidated Mineral Substrate	Fine Unconsolidated Substrate	Mud
Geologic Substrate	Unconsolidated Mineral Substrate	Fine Unconsolidated Substrate	Sand

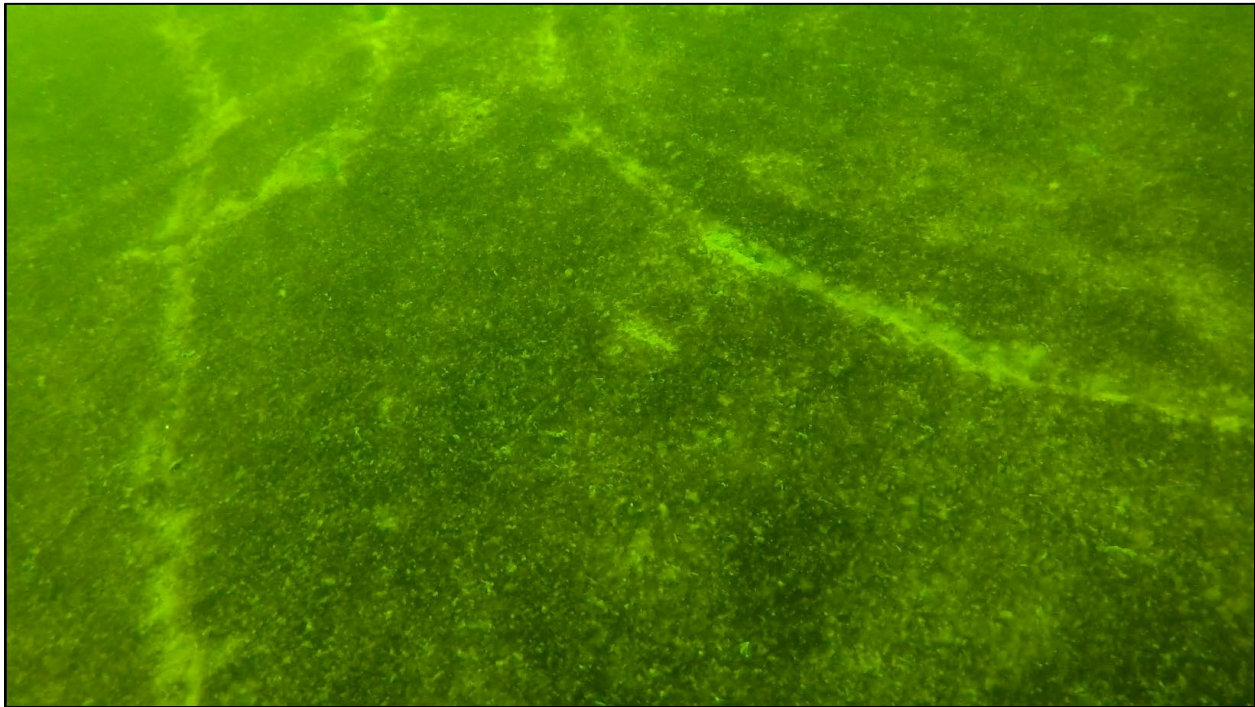


Image 6. Firm mud and sand sediment with benthic diatoms on the bottom of the proposed lease site (April 4, 2022).

Position and Distance to Shore

The measuring tools 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.

WGS84 Coordinates – 3.87 acres (Figure 2)

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>	
NW	43.734473 N	70.157322 W	<i>then 497.70 feet at 90° True to</i>
NE	43.734473 N	70.155439 W	<i>then 338.28 feet at 180° True to</i>
SE	43.733545 N	70.155439 W	<i>then 497.71 feet at 270° True to</i>
SW	43.733545 N	70.157322 W	<i>then 338.28 feet at 360° True to NW.</i>

Table 3: Approximate Distances to Shore (Figures 1 & 2):	
SW Corner to Lower Basket Ledge, nearest point (~MLW)	~800 feet to the southwest
NW Corner to Basket Island, nearest point (~MLW)	~1,790 feet to the west
NW Corner to Upper Basket Ledge, nearest point (~MLW)	~1,980 feet to the north/northwest
NE Corner to Great Chebeague Island, nearest point (~MLW)	~3,920 feet to the southeast
NE Corner to Red Nun "16" (NOAA Chart)	~3,500 feet to the east
SE Corner to Great Chebeague Island, nearest point (~MLW)	~3,840 feet to the southeast
SE-SW Boundary to Green Radar Reflector "15" (NOAA Chart)	~1,100 feet to the south



Figure 2: Proposed lease area drop camera transect (April 4, 2022).

The criteria MDMR uses to determine the suitability of an experimental aquaculture operation to a particular area (MDMR Regulations Chapter 2.64(7)(A)) are discussed, with respect to the proposal, below:

(1) Riparian Owners Ingress and Egress

The proposed lease is located ~000 feet to the north of Lower Basket Ledge at the nearest point, between Basket Island to the west and Great Chebeague Island to the east (Figure 1). There are no riparian properties within 1,000 feet of the proposal, and no moorings were observed in the general vicinity during DMR's site assessment on April 4, 2022. The Great Chebeague Island shoreline exhibits moderate residential development, with sporadic docks and moorings. The nearest point of Great Chebeague Island is approximately 3,840 feet from the proposal, which is likely sufficient for the docks and moorings along the shoreline to be accessed without interference.

A Harbormaster Questionnaire was requested from the Chebeague Island harbormaster on March 19, 2022. As of completing this report, a response had not been received.

(2) Navigation

The proposed lease is located in navigable waters in an area of Casco Bay that generally experiences heavy commercial and recreational vessel traffic, particularly during the summer months. MDMR visited the site on April 4, 2022 and did not observe vessel traffic in the vicinity of the proposal, but the timing of the site visit likely did not coincide with the heaviest vessel traffic in the area. The navigational channel is marked by Red Nun "16", which is to the northeast of the proposal near the Great Chebeague Island shoreline, and a green beacon marking the navigational hazard of Lower Basket Ledge. Therefore, most vessel flow is likely to avoid the proposed lease site, which is located ~1,100 feet to the north of the beacon marking Lower Basket Ledge. Additionally, if the proposed lease were granted, ~3,500 feet would remain between the proposal and Red Nun "16", where there is currently ~3,900 feet between Red Nun "16" and green beacon marking Lower Basket Ledge.

However, not all vessel traffic in the area occurs within the marked navigational channel. Smaller and/or recreational vessels have routinely been observed operating outside of marked navigational channels throughout Casco Bay by MDMR staff. Two public comments submitted to MDMR during the 30-day comment period for this proposal expressed navigational concerns and indicated that the area experiences a large amount of vessel traffic. Moreover, the Coastal Waters Committee of Chebeague Island (CWCCI) submitted a comment that highlighted potential impacts to navigation and requested that all surface gear, including the four corner mooring buoys, be removed from the site by May 1, annually. The CWCCI further stated that the presence of surface gear after this date would create a hazard to navigation to all boaters. It is therefore possible that granting the lease, as applied for, may interfere with navigation and navigational safety in the area. A requirement that all gear except for (24) mooring blocks, connected with chains, be removed from the site between April 30 and November 1 each year would reduce potential impacts to navigation.

A Harbormaster Questionnaire was requested from the Chebeague Island harbormaster on March 19, 2022. As of completing this report, a response had not been received.

(3) Fishing and Water-Related Uses

At the time of MDMR's site assessment on April 4, 2022, no lobster trap buoys were observed in the general vicinity of the proposed lease area. However, the lobster (*Homarus americanus*) fishery in nearshore Maine is seasonal, following the migration and molt cycle of lobsters. Therefore, lobster fishing may exist to a greater extent or in closer proximity to the proposal later in the season than when the site visit was conducted. From June 2 to October 31, the applicant is proposing to remove all surface gear from the site except for four corner mooring buoys. The CWCCI comment submitted to MDMR during the 30-day comment period indicates that the presence of surface gear, including the four corner mooring buoys, may interfere with lobster fishing in the area after April 30, annually. Potential interference with lobster fishing could occur in the form of either gear entanglement, or perceived risk of gear entanglement resulting in lobster fishermen avoiding the area.

A Harbormaster Questionnaire was requested from the Chebeague Island harbormaster on March 19, 2022. As of completing this report, a response had not been received.

(4) Other Aquaculture Uses

Five Limited Purpose Aquaculture (LPA) licenses, four leases, and two pending lease applications are located within one mile of the proposed lease (Figure 3). The closest active aquaculture activity to the proposal is the lease CAS BASK2, which is ~1,200 to the east and authorized for the suspended culture of shellfish.

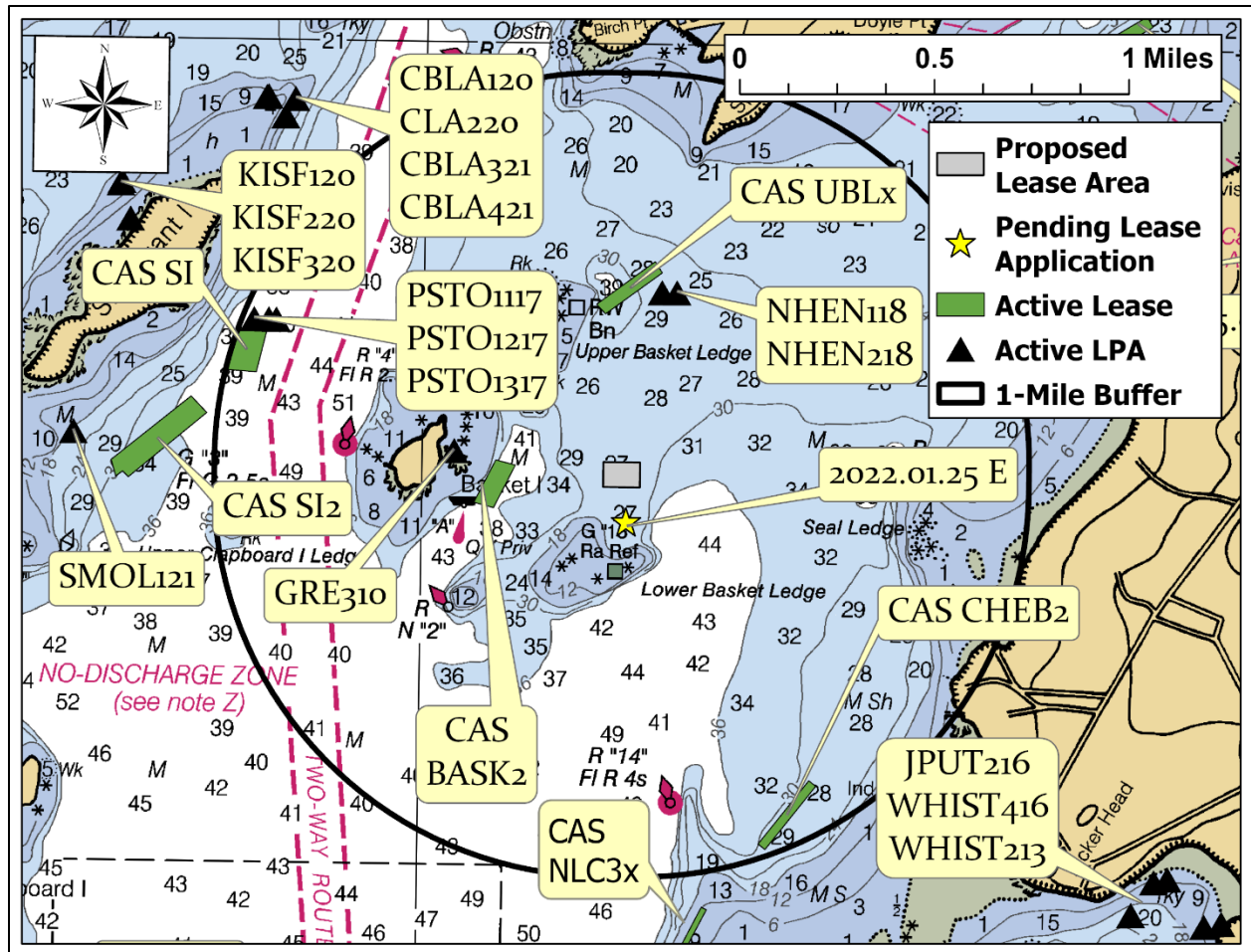


Figure 3: Aquaculture activity near the proposed lease area.

(5) Existing System Support

Wildlife

According to GIS (Geographic Information System) data maintained by the Maine Department of Inland Fisheries and Wildlife (MDIF&W) and available through the Maine Office of GIS, the proposed lease is approximately 715 feet from mapped Tidal Wading Bird and Waterfowl Habitat (Figure 4). This habitat type is defined under Maine's Natural Resources Protection Act (NRPA) as Significant Wildlife Habitat. The proposed lease is also over 1,080 feet to the east of Great Blue Heron (*Ardea herodias*) habitat, which is considered a Species of Special Concern in Maine (Figure 4).

Additionally, what appeared to be an osprey (*Pandion haliaetus*) nest was observed on the green beacon marking Lower Basket Ledge at the time of MDMR's site visit on April 4, 2022 (beacon photo in Images 3 & 4; beacon location in Figure 1). Various gulls (*Larus sp.*) were also observed on the exposed portion of Lower Basket Ledge.

On February 15, 2022, a Wildlife Biologist at MDIF&W responded, by email, to a "Request for Agency Review and Comment" stating "Minimal impacts to wildlife are anticipated for this project".

Finally, the underwater assessment conducted on April 4, 2022 revealed abundant benthic diatom on sand and mud sediment with burrows, castings, and drifting, unattached macroalgae..

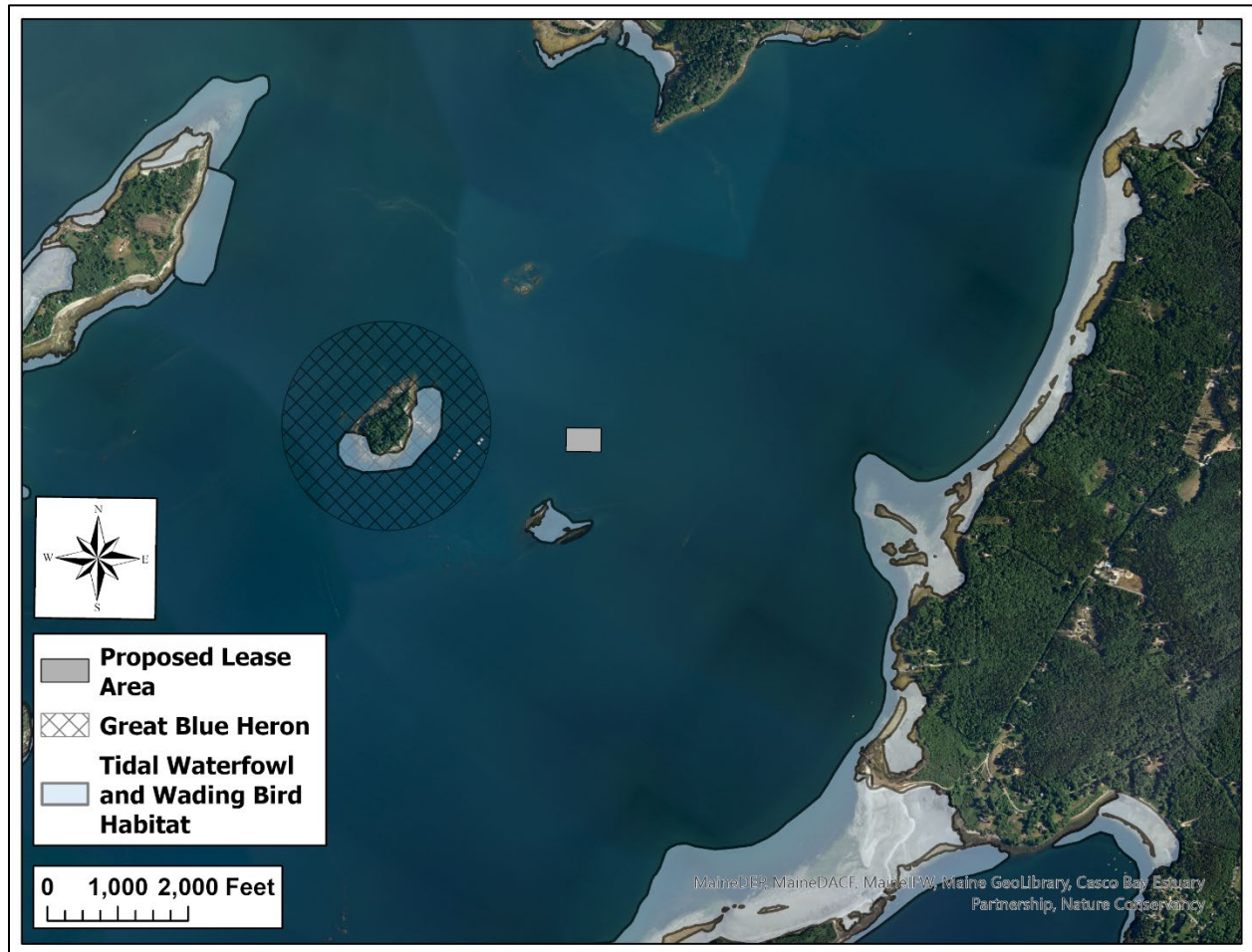


Figure 4: Tidal Wading Bird and Waterfowl Habitat⁹ and Endangered, Threatened, and Species of Concern Habitat¹⁰ near the proposed lease site.

Eelgrass

Historical eelgrass (*Zostera marina*) data collected by The Maine Department of Environmental Protection (MDEP) in partnership with the Casco Bay Estuary Partnership indicates that, in 2018, the closest observed eelgrass bed to the proposed lease was located approximately 700 feet to the south of the proposed site, near Lower Basket Ledge (Figure 5). Additionally, the underwater assessment conducted by MDMR staff during the site visit did not find evidence of eelgrass beds within the proposed lease area.

⁹ Data obtained from MDIWF maintained SDE Feature Class “GISVIEW.MEIFW.Twwh”

¹⁰ Data obtained from MDIFW maintained SDE Feature Class “GISVIEW.MEIFW.ETSC”

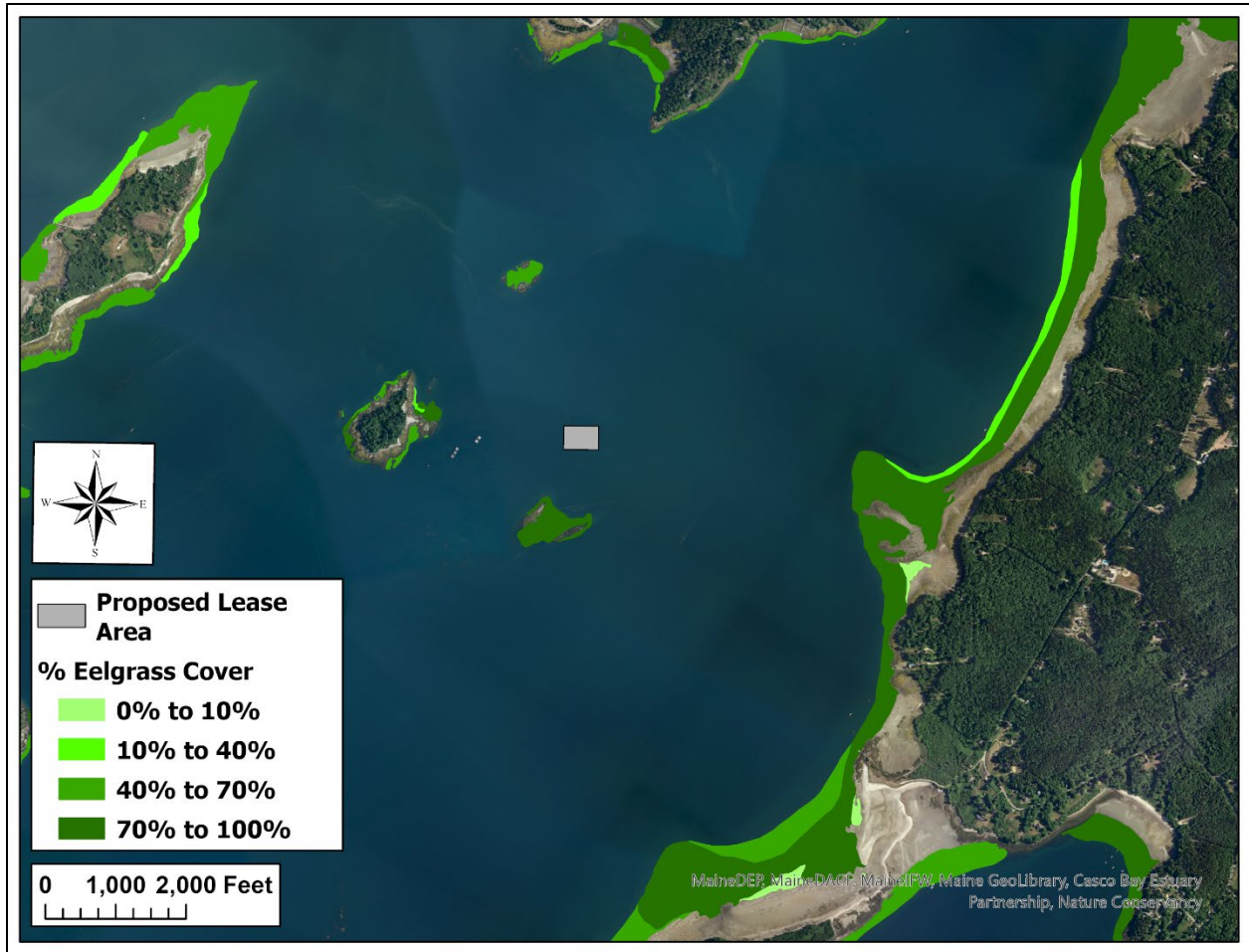


Figure 5: Historical eelgrass (*Z. marina*) in vicinity of proposed lease.¹¹

6) Source of Organisms to be Cultured

The applicant intends to source sugar and skinny kelp seed from Summit Point, LLC in Falmouth, Maine. This is an approved source of seed.

(7) Interference with Public Facilities

There are no beaches, parks, or docking facilities owned by federal, state, or municipal government within 1,000 feet of the proposed lease site (Figure 6). The nearest conserved land to the proposal is Basket Island, which is held in private conservation by the Chebeague and Cumberland Land Trust, Inc. Conserved lands are not included in the decision criteria for granting experimental leases, as per MDMR Regulations Chapter 2.64(11)(A)).

¹¹ Data obtained from MDEP maintained SDE Feature Class "GISVIEW.MEDEP.Eelgrass2018"

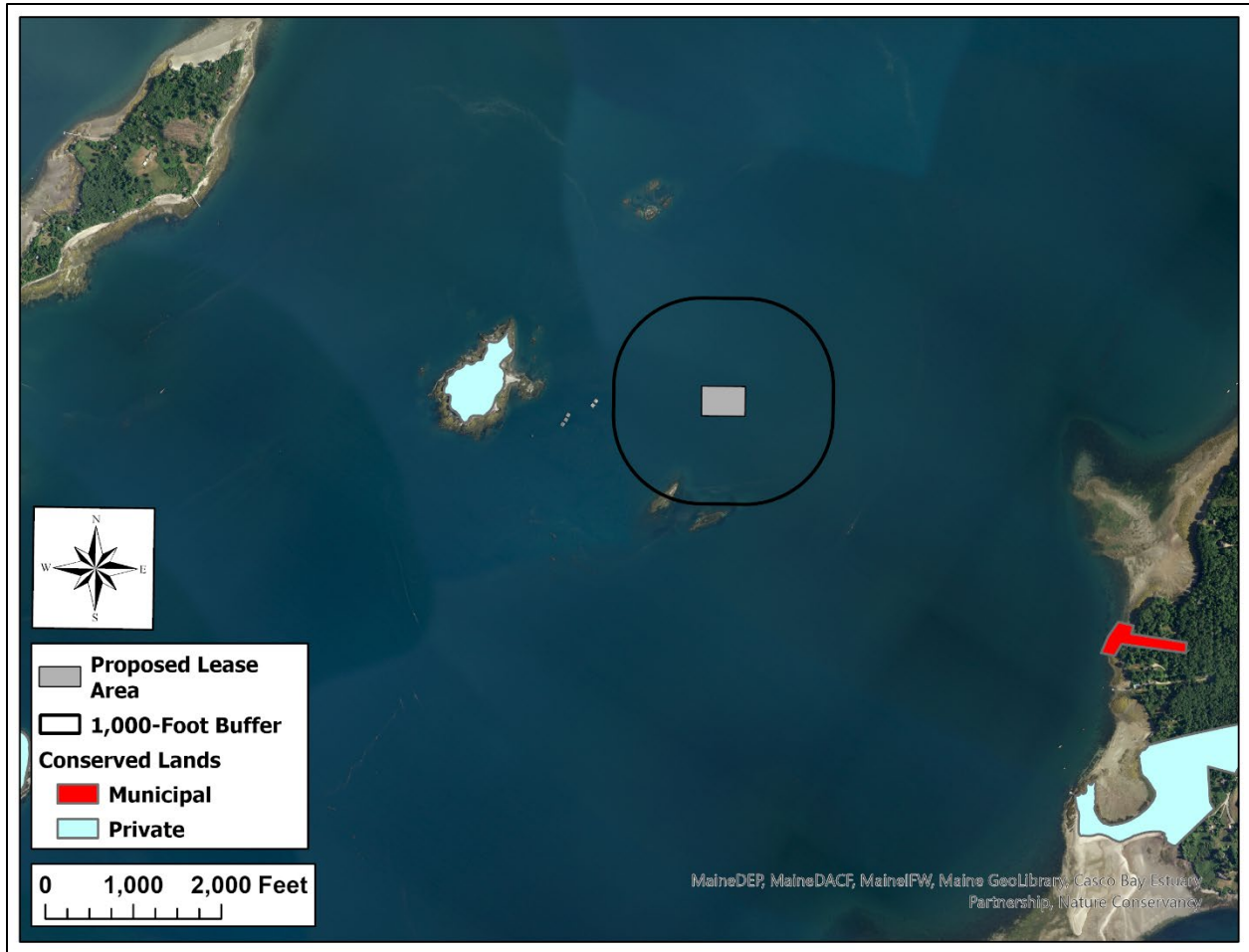


Figure 6: Conserved land near the proposed lease site.¹²

¹² Data obtained from SDE Feature Class sourced from The Maine Office of GIS "GISVIEW.MECONSLANDS.Conserved_Lands"