

Figure 1: Vicinity map¹

Location: Goose Cove, Western Bay, Trenton, Hancock County, Maine

Purpose: Standard lease for the suspended culture of American/eastern oysters (*Crassostrea virginica*)

Site Review by: Marcy Nelson, Flora Drury, and Cheyenne Adams

Report Preparation by: Flora Drury, Cheyenne Adams, and Marcy Nelson

Report Completed: January 6, 2021

¹Unless otherwise noted, all figures in this report were created in ArcMap version 10.6 using digitized NOAA Nautical Charts or geo-referenced aerial photographs provided by The Maine Office of GIS (orthoCoastalDownEastCoast2008, previously known as Low_Tide_2008).

Application Overview

The applicant, Brian Harvey, is requesting 5.93² acres in Goose Cove in Western Bay, for the suspended culture of American/eastern oysters (*Crassostrea virginica*) (Figures 1 & 2). The proposed lease area occupies the same general footprint as terminated leases BHB GC1, BHB GC2, and BHB GC3, which were in operation between 2008 and 2019.³ The applicant proposes to cultivate American/eastern oysters using floating plastic mesh ADPI™ oyster bags (20”x36”x4”) and predator netting (4’x100’, with 1” x 1” mesh) deployed on the bottom of the proposed lease.^{4,5}

General Characteristics

MDMR staff Flora Drury and Cheyenne Adams assessed the proposed lease site on September 3, 2020. MDMR arrived on site at approximately 10:00 am and assessed the proposed lease and surrounding area; an initial underwater assessment of the site via snorkel was conducted at this time. MDMR staff Marcy Nelson, Flora Drury, and Cheyenne Adams returned to the site on October 22, 2020 to conduct a more comprehensive underwater assessment of the site via SCUBA transect.

The proposed lease is located near the head of Goose Cove, in Trenton, Maine. The Trenton shoreline to the east, north, and west of the proposal is rocky, with a few gravel beaches. At low water, extensive mudflats are exposed to the north of the proposal. The surrounding uplands are dominated by mixed forest and residential development; approximately 20 houses are located along this shoreline in the vicinity of the proposal.



Image 1: Looking north from near the NW Corner of the proposed lease site (September 3, 2020).

² Applicant originally requested 6 acres. DMR calculations, based on the coordinates provided by the applicant, indicate the area is 5.93 acres.

³ BHB GC1 was terminated in 2018, while BHB GC2 and BHB GC3 were terminated in 2019.

⁴ Application, page 4

⁵ Page 15 of the application (labelled as page 16) indicates that there will be no surface gear “in the Goose Cove segment”. It is unclear what this means, and should be clarified during the public hearing.



Image 2: Looking northwest from near the NW Corner of the proposed lease site (September 3, 2020).



Image 3: Looking south from south of the proposal, near the mouth of Goose Cove (October 22, 2020).



Image 4: Looking southeast from near the NW Corner of the proposed lease site (October 22, 2020).

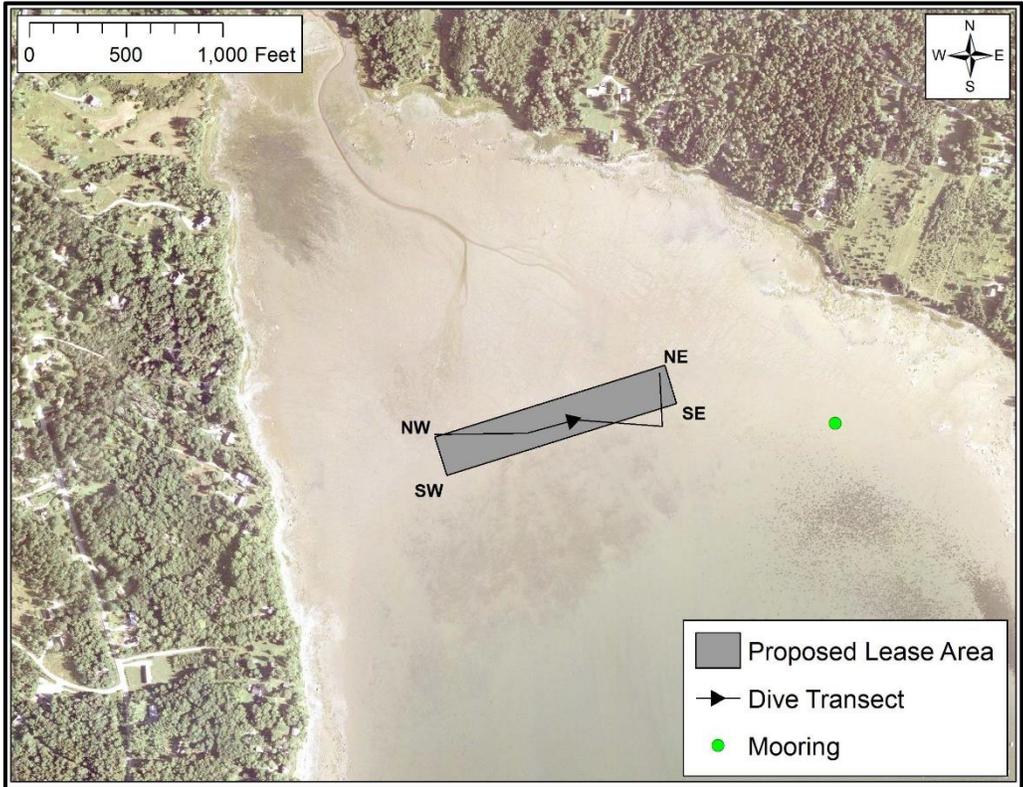


Figure 2: Proposed lease area, mooring observed on September 3, 2020, and approximate dive transect conducted on October 22, 2020.⁶

⁶ Aerial photograph provided by The Maine Office of GIS (orthoCoastalDownEastCoast2008).

Depth

At the time of MDMR's site assessment on September 3, 2020, depths at the corners of the proposed lease area ranged from 10.2 to 10.8 feet. Measurements were taken at approximately 11:00 am; high tide was predicted at 12:38 pm with a height of 10.43 feet (Table 1). Correcting for tidal variation derives corner depths ranging from approximately 1.5 to 2.1 feet at mean low water (MLW, 0.0 feet).

Table 1. Tide predictions for Pretty Marsh Harbor, Maine (44.3333° N, 68.4167° W).⁷

Date	Time	Height (ft)
9/3/2020	12:11 AM	11.18 H
9/3/2020	6:27 AM	0.05 L
9/3/2020	12:38 PM	10.43 H
9/3/2020	6:37 PM	0.57 L

Bottom Characteristics

MDMR staff observed the bottom characteristics of the proposed lease site via a SCUBA transect on October 22, 2019 (Figure 2). 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; no sediment samples were collected, or grain size analysis performed. Mud composed most of the proposed lease bottom covered in the dive transect, and shell rubble was present sporadically (Images 5 & 6).

Table 2: Bottom characteristics of 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	

⁷ <http://tbone.biol.sc.edu/tide/tideshow.cgi>

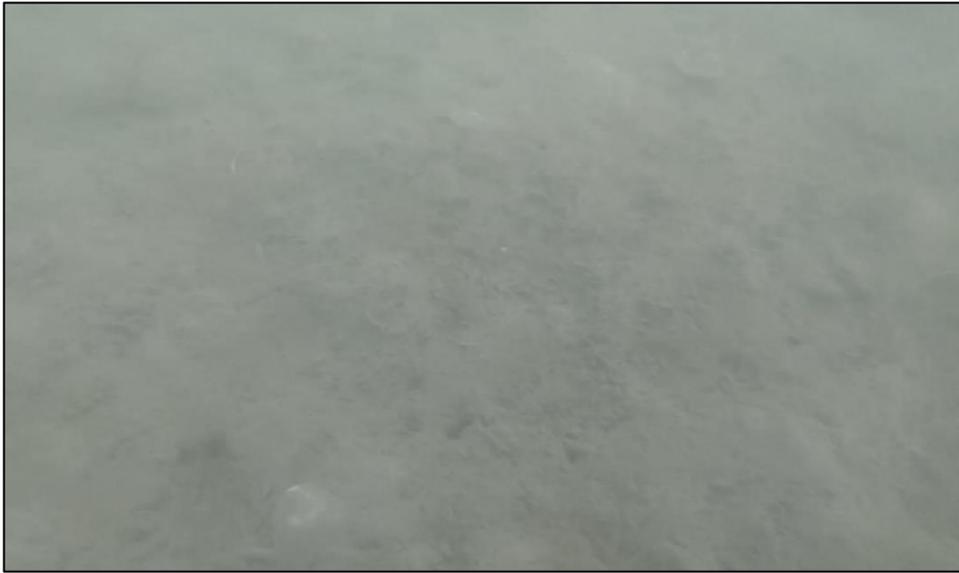


Image 5: Mud observed on bottom of proposed lease site during dive transect conducted on October 22, 2020.



Image 6: Shell rubble observed during dive transect conducted on October 22, 2020.

Position and Distances to Shore

POSAID Positioning Software was used to verify the distances and bearings between proposed lease corners. Distances to shore were determined using the measuring tool in ArcMap 10.6, digital orthophotography provided by the Maine Office of GIS, and the application coordinates.

Application Coordinates – 5.93 Acres (Figure 2)

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>
NW	44° 25' 49.614" N	68° 23' 21.807" W then 1,247.76 feet at 73.03° True to
NE	44° 25' 53.21" N	68° 23' 5.360" W then 206.67 feet at 163.52° True to
SE	44° 25' 51.253" N	68° 23' 4.5522" W then 1,245.91 feet at 252.97° True to
SW	44° 25' 47.65" N	68° 23' 20.969" W then 207.98 feet at 343.00° True to NW.

Table 3: Approximate distances from proposed lease to surrounding features (Figures 1 & 2). Unless otherwise noted, measurements were made using digital orthophotography provided by the Maine Office of GIS (*orthoCoastalDownEastCoast2008*).

Feature	Distance
NW Corner to mudflats to the north (~MLW, NOAA Chart)	~255 feet to the north
NW Corner to western shoreline of Goose Cove (MLW, NOAA Chart)	~430 feet to the west
NE Corner to mudflats to the north (~MLW, NOAA Chart)	~320 feet to the north
NE Corner to eastern shoreline of Goose Cove (MLW, NOAA Chart)	~520 feet to the east
SE Corner to Nearest Mooring	~830 feet to the southeast
SW Corner to Goose Cove 6-foot contour line (NOAA Chart)	2,180 feet to the south

The criteria MDMR uses to determine the suitability of an aquaculture operation to an area (MDMR Regulations Chapter 2.37(1)(A) are discussed, with respect to the proposal, below:

(1) Riparian Ingress and Egress

At the time of MDMR’s site assessment on September 3, 2020, approximately seven sets of stairs were observed, leading from the uplands to the shoreline on various riparian parcels in the general vicinity of the proposed lease. Canoes and kayaks were also observed on the nearby shorelines, and during the September 3, 2020 site visit two kayaks were launched from the northwest shoreline of Goose Cove. According to the NOAA chart, at mean low water the proposal is located approximately 520 and 430 feet from the eastern and western shorelines of Goose Cove, respectively. According to the NOAA chart, water within the proposal, and the water that separates the proposal from the low water line on either shoreline is less than 1 foot deep, while depth measurements taken during the site visit indicate the area is between 1 and 2 feet at mean low water. Given the distance between the proposal and the surrounding shorelines, it is unlikely that the proposal will interfere with riparian access to nearby shorelines, as riparian access is likely to be hindered more by tidal stage and shallow water depths.

Additionally, during the September and October 2020 site visits, a single mooring was observed over 800 feet to the southeast of the proposal. Due to this distance, and because the proposed

lease is not located between the existing mooring and the main navigation channel to the south, the proposal is unlikely to interfere with use of the mooring.

(2) Navigation

The proposed lease site is located near the head of Goose Cove in Trenton, Maine. As a result of the location, and because surrounding water depths decrease to a few feet or less at low water, vessel traffic within the area is likely restricted to higher tidal stages or to shallow draft vessels. During MDMR's site visits in September and October of 2020, kayaks and a stand-up paddleboard were observed operating in the general area. As the application proposes some of the area to contain only predator netting, when the tidal state is appropriate for the vessel, vessels should be able to navigate over sections of the proposal without interference. However, the application shows no delineation between sections of the proposal that would contain surface gear and antipredator netting, and instead proposes to deploy rows of gear on the site containing only surface gear, rows of gear containing only antipredator netting, and rows of gear containing both.

Due to the natural restrictions to navigation in the area, and because over 400 feet are located between the proposal and the eastern and western shorelines of Goose Cove, navigation in the area is unlikely to be prevented.

(3) Fishing and Other Uses

During MDMR's site assessments on September 3 and October 22, 2020 no commercial or recreational fishing activity was observed within or around the boundaries of the proposed lease. However, during the dive transect conducted on October 22, 2020, hard clams (*Mercenaria mercenaria*) were observed in abundance within the proposed lease area. The abundance of hard clams is likely a result of seeding that occurred in this area when it was leased by another individual.⁸ Due to the abundance of hard clams, and due to the shallow depth of the proposal at lower tidal stages, it is possible that shellfish harvesting occurs in the area. The application requests that shellfish harvesting be restricted on the proposed lease, if granted. Even if this request for exclusive use is not granted, it is unlikely that harvesters would be able to harvest from within the proposed lease, as surface gear and predator netting are proposed to be deployed in rows within the lease.⁹

Although less abundant than hard clams, American oysters (*C. virginica*) were also observed within the proposed lease area. It is likely that at least some of the oysters observed within the proposed lease are being cultured by the applicant, as the applicant and his wife each hold four Limited Purpose Aquaculture (LPA) licenses within the proposed lease area for the culture of American oysters using antipredator netting deployed on the ocean floor.

Although not observed during MDMR's visits, light recreational fishing may occur in the general vicinity and would likely be most prevalent during the summer months.

⁸ Terminated leases BHB GC1, BHB GC2, and BHB GC3

⁹ Application, page 31

(4) Other Aquaculture Uses

The applicant, Brian Harvey, and his wife Brenda Harvey each hold four Limited Purpose Aquaculture (LPA) licenses within the proposed lease area for the culture of shellfish (Figure 3). During MDMR’s dive transect of the proposal on October 22, 2020, rope secured to the sediment, assumed to be associated with these LPA licenses, was observed (Image 7). According to the application, these eight LPA licenses will be “utilized until lease approval”.¹⁰ At the time of this report’s publication, eight other LPA licenses and one other aquaculture lease, BHB GC4, were located within one mile of the proposal (Figure 3). BHB GC4 is a 49.8-acre lease comprised of two tracts, approved for the suspended culture of American oysters, and located over 2,300 feet to the south/southeast of the proposal.

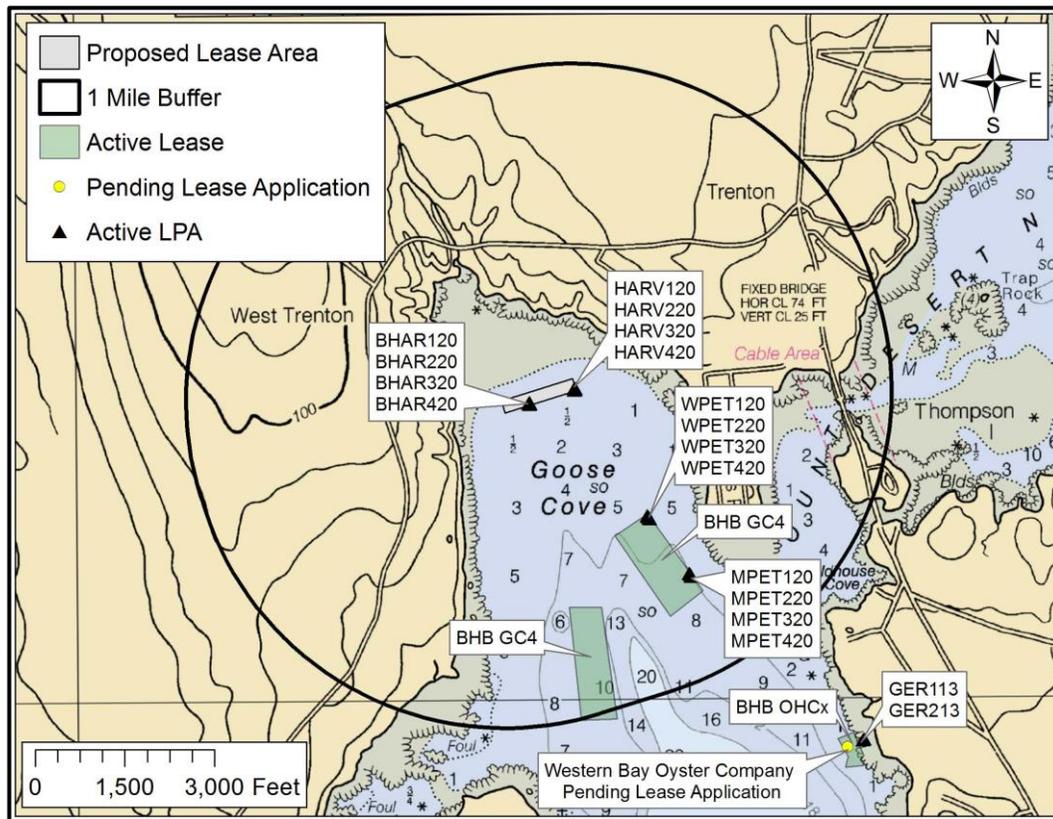


Figure 3: Aquaculture leases and Limited Purpose Aquaculture (LPA) licenses within one mile of the proposed lease area.

¹⁰ Application, page 11



Image 7: Rope secured to sediment, observed during dive transect conducted on October 22, 2020.

(5) Existing System Support

On October 22, 2020, MDMR staff conducted a SCUBA transect within the proposed lease site to assess the epibenthic ecology of the area (Figure 2). The bottom of the proposed lease is composed primarily of mud, with some sections of shell rubble (Images 5 & 6). Shell rubble was composed primarily of northern quahog (*Mercenaria mercenaria*), softshell clam (*Mya arenaria*), razor clam (*Ensis directus*), Atlantic surf clam (*Spisula solidissima*) and barnacle (*Balanus sp.*) shells.

Epibenthic macro flora and fauna observed during the dive transect are described in Table 4 (Images 8 & 9). The most abundant species observed within the proposed lease were hard clams (*Mercenaria mercenaria*), which were observed at a range of sizes within the proposal.

Table 4: Species observed by MDMR divers within the proposed lease site on October 22, 2020.

Species Observed	Abundance
Hard clam (<i>Mercenaria mercenaria</i>)	Abundant
American oyster (<i>Crassostrea virginica</i>)	Common
Green crab (<i>Carcinus maenas</i>)	Common
Green fleece (<i>Codium fragile</i>)	Common
Knotted wrack (<i>Ascophyllum nodosum</i>)	Common
Sea star (<i>Asterias sp.</i>)	Rare
Northern cerianthid (<i>Cerianthus borealis</i>)	Rare



Image 8: Hard clam (*M. mercenaria*) observed during dive transect conducted on October 22, 2020.



Image 9: Green fleece (*C. fragile*) observed within proposed lease on October 22, 2020.

Eelgrass (*Zostera marina*)

Historical eelgrass (*Zostera marina*) data collected by The Maine Department of Marine Resources indicate that, in 2008, the closest observed eelgrass bed to the proposed lease was located approximately 430 feet to the southeast (Figure 4). No eelgrass was observed by MDMR staff during the underwater assessments of the proposal on September 3, 2020 and October 22, 2020.

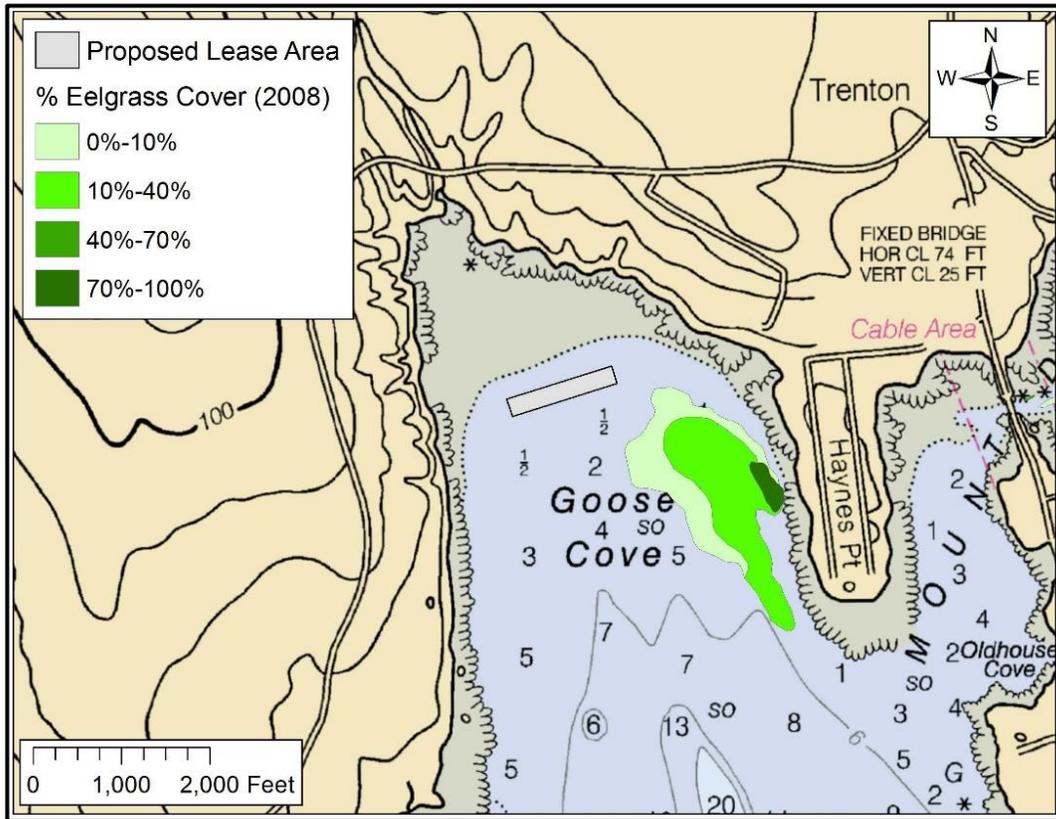


Figure 4: Historical eelgrass (*Z. marina*)¹¹ near the proposed lease site from 2008 survey.

Wildlife

During the September 3, 2020 site visit, MDMR staff observed double crested cormorants (*Phalacrocorax auritus*), laughing gulls (*Leucophaeus atricilla*), a common tern (*Sterna hirundo*), and a loon (*Gavia immer*) in the vicinity of the proposed lease. According to GIS (Geographic Information System) data maintained by Maine Department of Inland Fisheries and Wildlife (MDIF&W) and available through the Maine Office of GIS, the proposed lease is located within Tidal Wading Bird and Waterfowl Habitat specifically defined as emergent wetland-mudflat complex (Figure 5).

On May 7, 2020 Rebecca Settele (Wildlife Biologist, MDIF&W) responded by email to a “Request for Agency Review and Comment”, recommending that any boats used in the operations do not ground out on reefs, aquatic beds, and mud flats and also that the project footprint be reduced to the minimum size needed to have the least impact on waterfowl and wading bird populations. MDIFW also recommended that all construction and maintenance activity happen outside of the shorebird migration window of July 15th to September 30th.

In a follow-up email on December 21, 2020, Rebecca Settele indicated that MDIF&W anticipates “minimal impacts to wildlife” with the applicant’s proposed activities of accessing and working on the site at low water and harvesting from the site by hand.

¹¹Data obtained from Maine Office of GIS (Eelgrass2010).

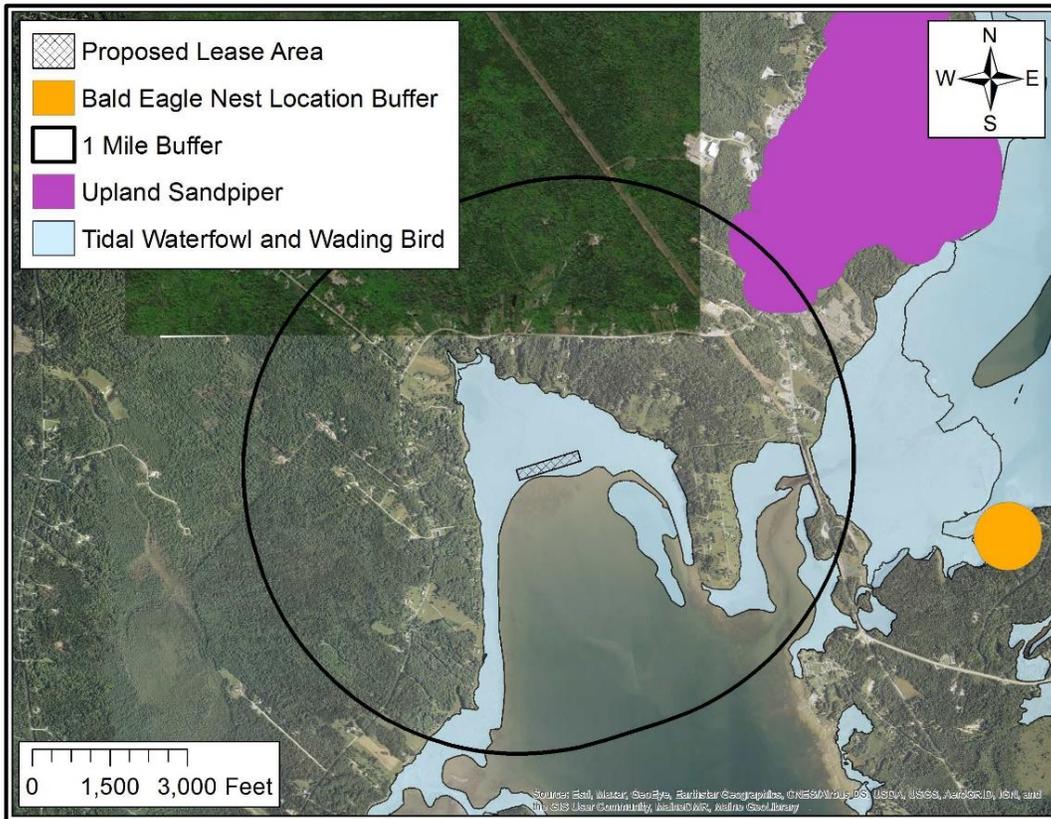


Figure 5: Tidal Wading Bird and Waterfowl Habitat¹², Bald Eagle Nests¹³, and Endangered, Threatened, or Species of Special Concern Habitat¹⁴ near the proposed lease site.

(6) Interference with Public Facilities

The proposed lease is not within 1,000 feet of any beach, park, docking facility, or conserved lands owned by federal, state, or municipal governments (Figure 6). The closest publicly owned parcels are an unnamed municipal lot located approximately 3,300 feet to the northeast, and a federally owned coastal parcel that is part of Acadia National Park approximately 4,440 feet to the southeast.

¹² Data obtained from MDIWF maintained SDE Feature Class "GISVIEW.MEIFW.Twwh"
¹³ Data obtained from USFWS: [https://services.arcgis.com/QVENGdaPbd4LUkLV/ArcGIS/rest/services/\('Maine_Bald_Eagles_2019_with_twn_cnty'\)](https://services.arcgis.com/QVENGdaPbd4LUkLV/ArcGIS/rest/services/('Maine_Bald_Eagles_2019_with_twn_cnty'))
¹⁴ Data obtained from MDIWF maintained SDE Feature Class "GISVIEW.MEIFW.ETSC"

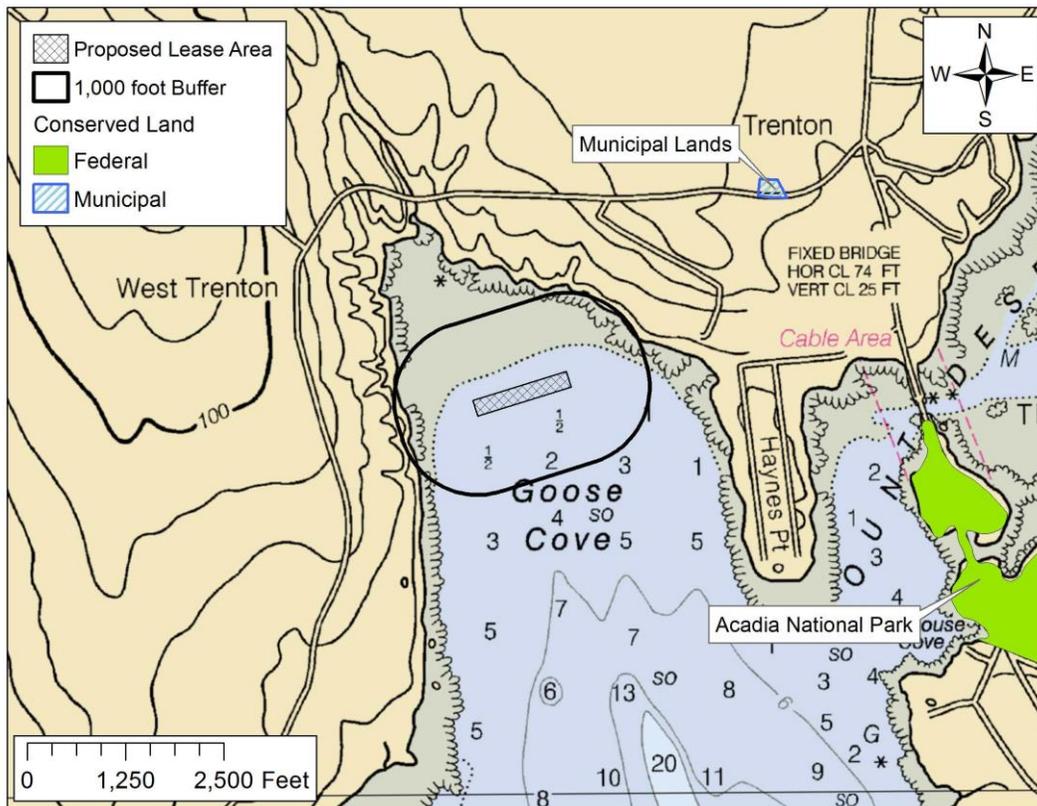


Figure 6: Public facilities near the proposed lease site.¹⁵

(7) Water Quality

The proposed lease area is currently classified as “Open/Approved” by the MDMR Bureau of Public Health for the harvest of shellfish.

(8) Lighting

According to the application, work beyond daylight hours would occur “when the 2-3 hours either side of low water occur near sunset or during some unforeseen or emergency event”.¹⁶ According to the applicant, headlamps would be used when operating beyond daylight hours.¹⁷ Additionally, the applicant proposes to deploy one small LED light on the proposed lease area to aid with navigation.¹⁷

(9) Noise

The proposed lease would be accessed and serviced by boats measuring less than 25 feet in length and powered by outboard motors under 100 horsepower.¹⁸ The boats and motors proposed

¹⁵ Data obtained from SDE Feature Class sourced from The Maine Office of GIS “GISVIEW.MECONSLANDS.Conserved_Lands”

¹⁶ Application, page 10

¹⁷ Conversation between F. Drury and B. Harvey (12.16.20)

¹⁸ Application, page 9

are consistent with the size and type of vessel routinely used both commercially and recreationally along the Maine coast.

(10) Visual Impact

The proposed aquaculture operations comply with the MDMR's height and visual impact limitations.