Department of Marine Resources
Site Review #2016-02E

Maine Fresh Sea Farms, LLC
256 Lower Round Pond Road
Bristol, ME 04539
207-380-6478

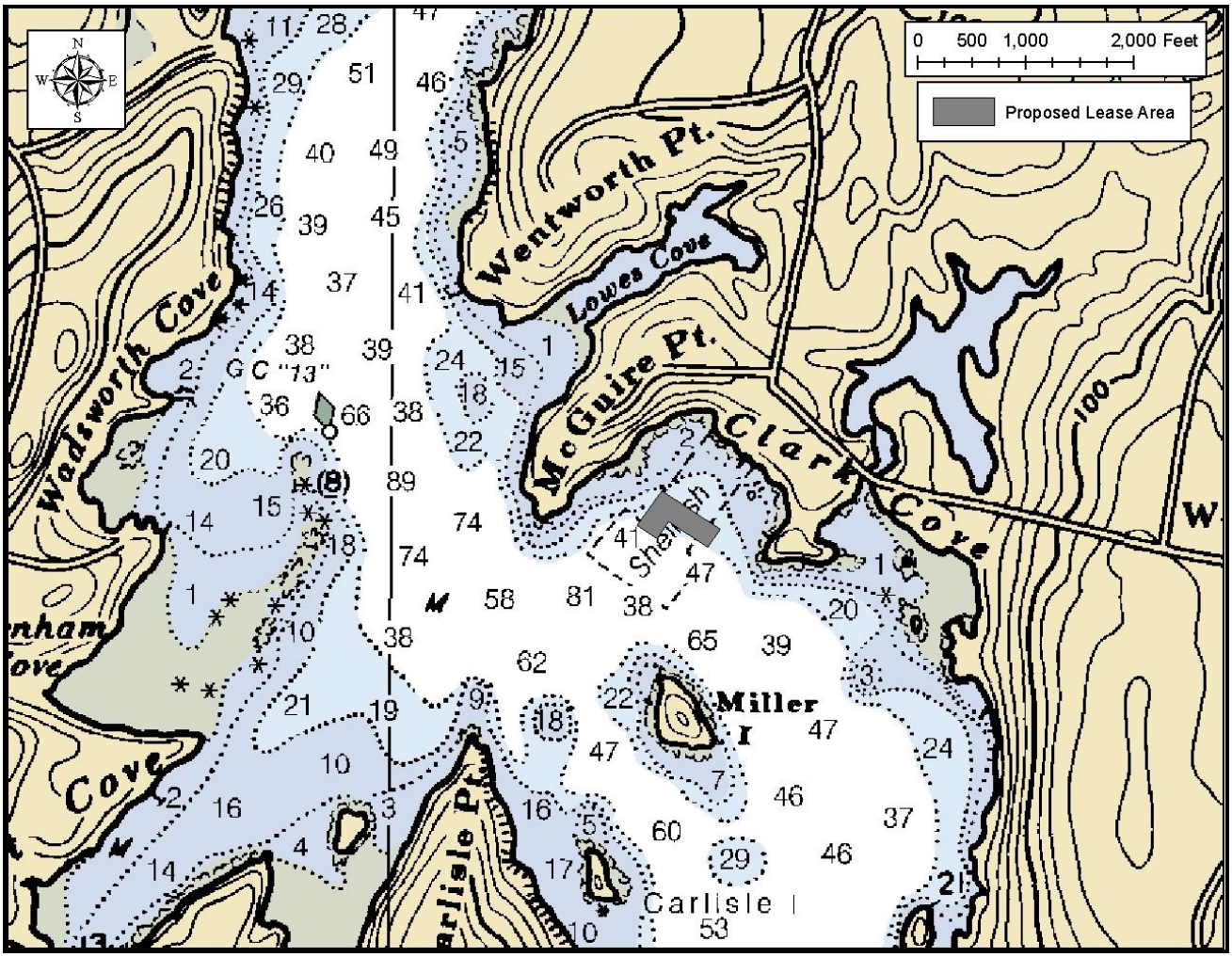

Figure 1: Vicinity map created in ArcMap version 10.1 using digitized NOAA Charts.

Location: Clark Cove, Damariscotta River, South Bristol, Lincoln County, Maine

Purpose: Experimental lease for the suspended culture of seaweeds (*Laminaria saccharina, Alaria esculenta, Laminaria digitata, Agarum cribrosum, Palmaria palmata, Porphyra spp, Chondrus crispus, Ulva lactuca, Gracilaria tikvahiae, Chorda tomentosa, Agardhiella spp, Desmerestia viridis, Scytosiphon spp, and Petalonia spp.*).

Site Review by: Jon Lewis, Marcy Nelson, and Flora Drury
Report Preparation by: Flora Drury, Marcy Nelson, and Jon Lewis September 28, 2016

On August 4, 2016 Maine Department of Marine Resources (MDMR) Scientists Jon Lewis, Marcy Nelson, and Flora Drury visited the proposed experimental aquaculture lease. MDMR staff arrived on site at approximately 10:19am; the tide was in the mid-flood stage at this time.

The applicant is requesting **3.92 acres** for the suspended culture of various species of seaweeds in the center of Clark Cove. Horizontal longlines measuring approximately 530 feet in length and located 3-10 feet below the surface of the water are proposed for this lease. The longlines, of which approximately 21 are proposed, will be spaced 20 feet apart if the lease is granted. The applicant has also proposed the use of a Porphyra net frame between the proposed long lines for experimental work with seeded netting. The proposed net frame is 64' L X 6' W and will be exposed ~3.5' out of the water two or three times each week for several hours (see Figure 8 in the application).

General Characteristics

The proposed lease occupies subtidal waters in the center of Clark Cove and abuts the northeast side of existing lease DAM CC2 (Figure 2). Upland characteristics consist of a rocky shoreline leading to mixed forest and grassy fields. Multiple houses are present along the shoreline of Clark Cove within 1,000 feet of the proposed lease site and others located at greater distances are visible from the proposed site. Clark Cove is used for both commercial and recreational purposes. Aquaculture gear, including a mussel raft and ~50 buoys, was present within the existing aquaculture lease DAM CC2 and Limited Purpose Aquaculture (LPA) sites BARK215 and BARK315 on August 4, 2016 (Image 1).

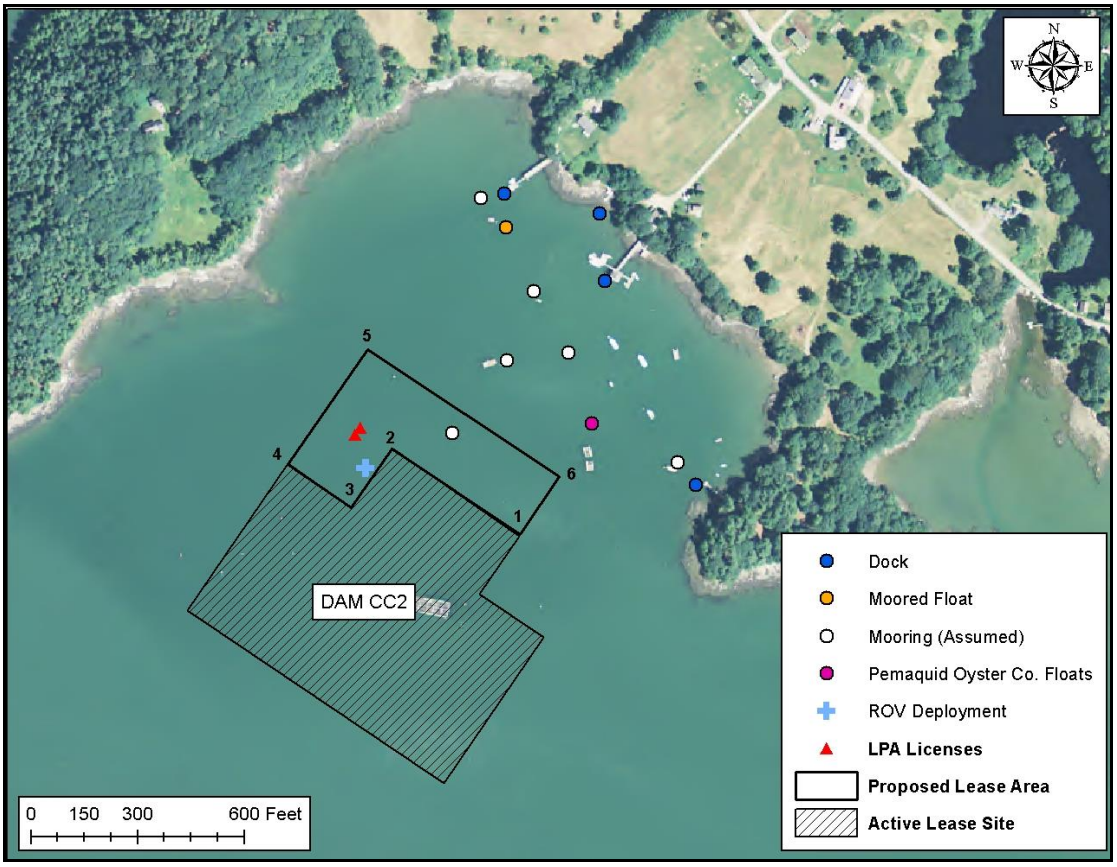

Figure 2: Map created in ArcMap version 10.1 using geo-referenced aerial photographs (Maine Office of GIS: *NAIP_2013*) and showing existing structures in the vicinity of the proposed lease area.

Image 1: Aerial photograph of existing aquaculture activity in vicinity of proposed lease site (DAM CC2, BARK215, BARK315, and Pemaquid Oyster Company floats) taken August 24, 2016.

Depth

The predicted time of low tide for Walpole, Maine on August 4, 2016 was 7:03am. Tidal height was predicted at 0.77 feet below mean low water (MLW). High water was predicted to occur at 1:09pm and 10.03 feet above MLW. MDMR staff arrived on site and collected depths at approximately 10:19am.

Walpole, Damariscotta River, Maine[1]

(44.9333° N, 69.5800° W)

Date	Time	Height (ft)
8/4/16	12:35 AM	11.05 H
8/4/16	7:03 AM	-0.77 L
8/4/16	1:09 PM	10.03 H
8/4/16	7:15 PM	0.09 L

[1] *http://tbone.biol.sc.edu/tide/tideshow.cgi?site=Walpole%2C+Damariscotta+River%2C+Maine&units=f*

At the time of the Department's site assessment, water depths ranged from 27 feet at Corner 6 to 52 feet at Corner 4. Correcting to the nearest high water (+10.03') results in water depths roughly 4 feet greater than depths observed during the Department's site visit (31' -56'). Correcting to MLW (+/- 0.0') results in water depths roughly 6 feet less than depths observed by the Department (21'to 46').

Position and Distances to Shore

At the time of the Department's visit the proposed lease was not delineated with corner markers. However, many buoys of various sizes and colors populated the existing lease (DAM CC2) and LPAs (BARK215 and BARK315) within Clark Cove. WAAS (Wide Area Augmentation System) GPS was used to navigate to each corner of the proposed lease site using the application coordinates.

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 10.1, digitized NOAA Charts, digital orthophotography provided by the Maine Office of GIS (*Low_Tide_2004*), Google Earth imagery, and the application coordinates listed below.

NAD83 Application Coordinates 3.92 acres (Figure 2)

Corner	Latitude	Longitude
1	43° 55' 43.770"N	69° 34' 19.844"W *then 435.65 feet at 303.18^o True to*
2	43° 55' 46.124"N	69° 34' 24.827"W *then 200.43 feet at 213.78^o True to*
3	43° 55' 44.479"N	69° 34' 26.350"W *then 217.71 feet at 303.88^o True to*
4	43° 55' 45.678"N	69° 34' 28.819"W *then 394.53 feet at 34.30^o True to*
5	43° 55' 48.896"N	69° 34' 25.781"W *then 648.76 feet at 123.18^o True to*
6	43° 55' 45.390"N	69° 34' 18.361"W *then 196.70 feet at 213.49^o True to Corner 1.*

Approximate Distances (Figure 3):	
Corner 5 to Nearest Point, Mainland (MLW)	~ 260 feet to the northwest
NE Side (Corner 5 - Corner 6) to Nearest Dock on Northern Shore	~530 feet to the northeast
Corner 6 to Nearest Point, Mainland (MLW)	~ 360 feet to the east
Corner 6 to Dock on Clark Cove's Eastern Shore	~387 feet to the east
Corner 1 to Nearest Point, Miller Island (MLW)	~ 1,170 feet to the southwest
Corner 3 to Nearest Point, Miller Island (MLW)	~1,170 feet to the south
Corner 3 to Southern Boundary, Main Navigation Channel (MLW)	~970 feet to the south

Image 2: Aerial photograph of proposed lease site taken August 24, 2016.

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

At the time of MDMR's site assessment 4 docks, 2 sets of moored floats, and at least 13 assumed moorings were observed within 1,000 feet of the proposed lease site. The nearest documented dock is located approximately 387 feet to the east of the proposed lease site (Figure 2). A mooring with a pontoon boat attached was located within the proposed lease site. The second closest mooring to the proposed lease site was located approximately 175 feet to the northeast and held floats maintained by Pemaquid Oyster Company. GPS coordinates were collected at all docks and moored floats within Clark Cove; GPS points were also collected at moorings closest to the proposed lease site (See Docks, Moorings, and Moored Floats in Clark Cove).

Docks, Moorings, and Moored Floats in Clark Cove (WGS84)

Item	Latitude	Longitude
Dock	43°55'53.27"N	69°34'20.55"W
Dock	43°55'50.84"N	69°34'16.65"W

Dock	43°55'52.72"N	69°34'16.86"W
Dock	43°55'45.16"N	69°34'13.08"W
Mooring	43°55'53.14"N	69°34'21.42"W
Mooring	43°55'48.85"N	69°34'18.03"W
Mooring	43°55'48.62"N	69°34'20.38"W
Mooring	43°55'50.54"N	69°34'19.39"W
Mooring (Sailboat)	43°55'45.79"N	69°34'13.79"W
Mooring (Pontoon Boat)	43°55'46.57"N	69°34'22.49"W
Moored Float	43°55'52.33"N	69°34'20.47"W
Pemaquid Oyster Company Moored Floats	43°55'46.87"N	69°34'17.12"W

The proposed lease site, if granted, will not prevent water-borne access to and from riparian property. However, it may change the route riparian owners have traditionally taken to and from their property and moorings. According to Cecil Burnham, Harbormaster for the town of South Bristol, the proposed lease does not make riparian ingress and egress impossible but "it would be some concern in a foggy condition[2]."

This lease, if granted, will have to be diligently marked so that mariners in the area may easily avoid the associated gear in all conditions. The current level of marking at the applicant's LPA sites (BARK215 and BARK315) does not adequately notify mariners of aquaculture activity. On August 4, 2016 MDMR staff could not readily differentiate boundary markers from other gear. There were no buoys present with the words "Sea Farm" or the LPA identifier per MDMR Chapter 2 regulations.

On September 1, 2016 Marine Patrol Officer Kilgore and Officer Tourtelotte conducted an inspection of the aquaculture lease DAMCC2 in Clark Cove. The Marine Patrol Officers were unable to determine the lease boundaries for DAM CC2 and commented that buoys in the area were "scattered everywhere[3]."

The large number of buoys scattered throughout the proposed area, with no clear markings or readily discernable pattern of deployment, make it difficult to safely and efficiently navigate the area.

(2) Navigation

Vessels moving through the main channel of the Damariscotta River, located to the south, would not be impeded by the proposed activities due, in part, to the fact that an existing aquaculture lease (DAM CC2) sits between the proposed lease and the main channel.

There remains a minimum of ~260 feet between the western shore of Clark Cove and the west boundary of the proposed lease (MLW). Approximately 360 feet remains between the proposed lease site and the cove's eastern shore (MLW). Cecil Burnham, Harbormaster for the town of South Bristol, expressed concern that the proposed lease "crowds the area for boats entering the cove

[2] Cecil Burnham: South Bristol Harbormaster. Harbormaster Questionnaire. 3.25.16.
[3] MPO Kilgore and MPO Tourtelotte. Aquaculture Lease/License Inspection Form 2015: DAMCC2. 9.1.16.

especially on the north end." Mr. Burnham also noted that sailboats trying to sail to their moorings in Clark Cove may need more area to maneuver than the proposed lease allows[4].

As noted above, increased marking is needed on the current aquaculture activity in the area to ensure safe navigation. Local users, encountered during the MDMR site assessment on August 4, 2016, expressed concern about the confusing nature of the buoys and unlit raft that occupy the existing lease and LPA licenses in Clark Cove and indicated to MDMR scientists that they give the area a "wide berth" when operating boats. Corner markers, or a central marker when appropriate for LPA licenses, clearly reading "Sea Farm" are required by MDMR Regulations Chapter 2.80 and Chapter 2.90 (6)(B) for leases and LPAs, respectively. These markings are needed so that mariners may easily recognize and avoid the associated gear in all conditions.

(3) Fishing and Water-Related Uses

On August 4, 2016 lobster pot buoys owned by at least two different license holders were observed in Clark Cove. Two of these buoys were located between the west side of the proposed lease and the western shore of Clark Cove and one buoy was set to the north of the proposed lease site further inside Clark Cove. All other active lobster fishing noted on August 4, 2016 occurred in the main navigational channel to the south of the proposed lease area and existing mussel rafts. No lobster pot buoys were observed within the proposed lease area at this time. Cecil Burnham, Harbormaster for the town of South Bristol reported that he has been informed of kids setting lobster traps in the area during the summer months[4].

At the time of the Department's visit one lobster boat, the "Amelia Helen", was tied to a dock within Clark Cove. Multiple other vessels, including two sailboats and a pontoon boat, were also observed.

No other recreational or commercial fishing activity was observed within the area of the proposed lease at the time of the Department's site assessment. According to Cecil Burnham "not much of any recreational fishing" occurs in the area of the proposed lease[4].

Pemaquid Oyster Company maintains floats for the wet storage of shellfish approximately 175 feet to the north of the proposed NE corner. Company employees were present at the time of the MDMR site assessment.

(4) Other Aquaculture Uses

The names of and distances to MDMR leases and licenses nearest the proposal are listed below (Figure 3). Distances were measured, straight-line, in ArcMap version 10.1.

The managing partner of the applicant, **Maine Fresh Sea Farms,** has two existing LPA licenses within the proposed lease site for the cultivation of marine algae (**BARK215** and **BARK 315**).

Damariscove Seafood, LLC operates a standard lease in Clark Cove, Damariscotta River, South Bristol for the suspended culture of mussels, European and eastern oysters, northern quahogs, soft shelled clams, and sugar, winged, and fingered kelp, sea colander, dulse, nori/laver, Irish moss and sea lettuce (**DAM CC2**).
Location: Abuts proposed lease site to the south.

[4] Cecil Burnham: South Bristol Harbormaster. Harbormaster Questionnaire. 3.25.16.

The University of Maine operates an experimental lease in Lowes Cove, Damariscotta River, Walpole, for the suspended culture of a variety of shellfish and marine algae species (**DAM LW2**).
Location: ~1,424 feet to the northwest.

Mook Sea Farm, **Inc.** operates two experimental leases that are currently pending approval to be converted to a single standard lease near Peter's Island, Damariscotta River, South Bristol, for the suspended overwintering of eastern oysters **(DAM PIN** and **DAM PI**).
Location: ~1.2 miles to the south.

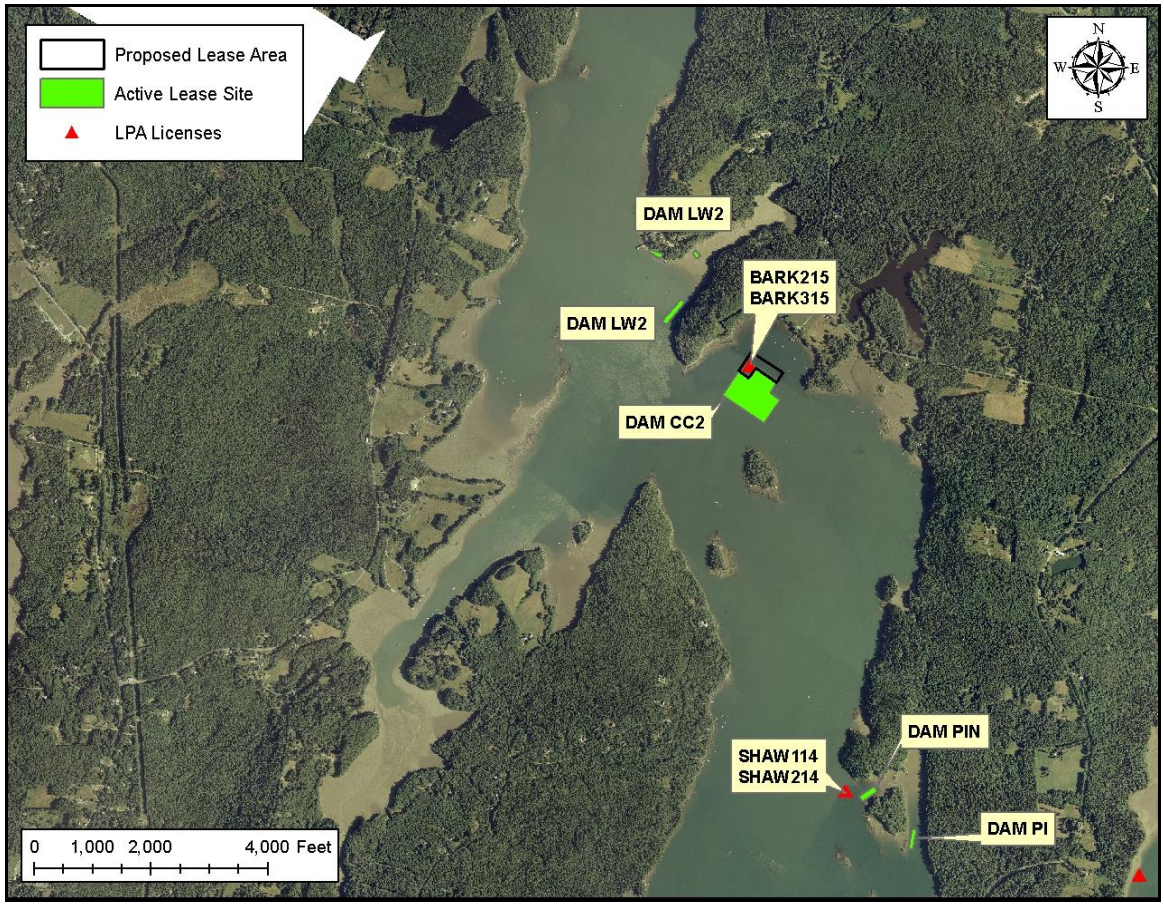

Figure 3: Map of other aquaculture uses in the area created in ArcMap version 10.1 using Maine Office of GIS data *(Low_Tide_2004*).

(5) Existing System Support

On August 4, 2016, MDMR examined the bottom of the proposed lease site with a Remotely Operated Vehicle (ROV). A soft mud bottom and strong currents were observed at this time. Occasional burrows were present in the sediment and *Mysida* species were observed in the proposed lease area as well. Due to the strong currents present at the time of visitation, maneuverability of the ROV, and therefore benthic observation, was limited. Underwater video was not collected as part of the review of this limited purpose (experimental) lease application.

Eelgrass

No eelgrass was observed from the limited benthic observation via ROV. Additionally, records of eelgrass distribution collected by MDMR in 2005 do not indicate historical eelgrass presence in Clark Cove (Figure 4).

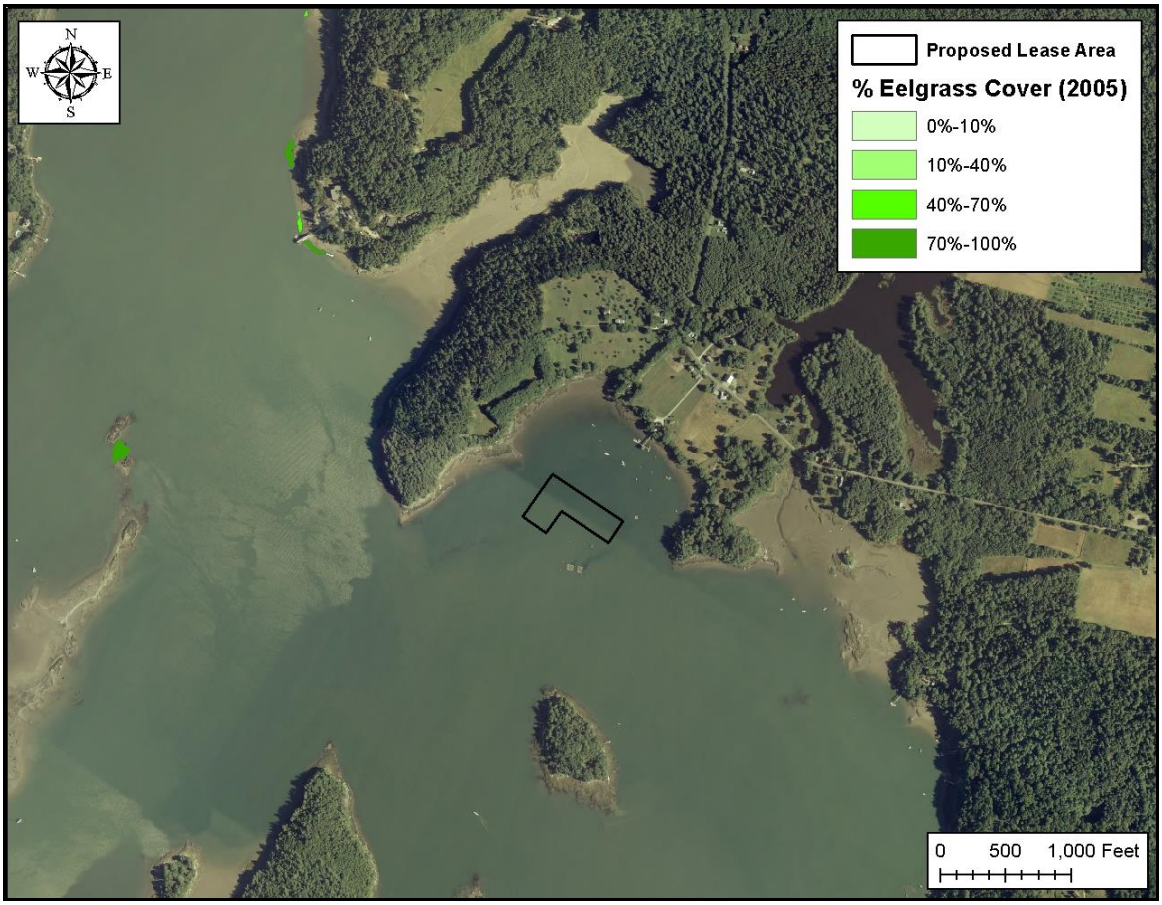

Figure 4: Historical eelgrass in vicinity of proposed lease site. Map created in ArcMap version 10.1 using Maine Office of GIS data *(Low_Tide_2004* and *Eelgrass_2010*).

Wildlife

Herring gulls (*Larus argentatus*), double-crested cormorants (*Phalacrocorax auritus*), and common terns (*Sterna hirundo*) were observed in the vicinity of the proposed lease site on August 4, 2016. Individuals of the three aforementioned species were observed roosting on the mussel raft located within abutting lease DAMCC2. The Maine Department of Inland Fisheries and Wildlife (MDIFW) does not consider Clark Cove to be Tidal Wading Bird and Waterfowl Habitat. John Maclaine (Habitat Outreach Biologist for MDIFW), in an email dated March 4, 2016, stated, "As there are no apparent direct impacts to resources under MDIFW jurisdiction, we have no comment on this project."

(6) Interference with Public Facilities

There are no public docking facilities or beaches within 1,000 feet of the proposed lease. A conservation easement held by the Maine Department of Inland Fisheries and Wildlife is located ~486 feet to the east of the proposed lease at the nearest point of vegetated upland.

(7) Water Quality Classification

The proposed lease is in an area currently classified by the Department of Marine Resources Water Quality Classification program as “open/approved for the harvest of shellfish”. This classification, however, would not affect the harvest of algae from the proposed lease site. Likewise, biotoxin, or PSP closures, would not affect the proposed lease activities.