

Figure 1*: Vicinity map

Location: Pleasant Island (Unorganized Territories), Muscle Ridge Channel, Knox County, Maine

Purpose: Standard lease for the suspended culture of American oysters (*Crassostrea virginica*) and Sea scallops (*Placopecten magellanicus*).

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Report Preparation by: Flora Drury, Marcy Nelson, and Jon Lewis

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* All figures in this report were created in ArcMap version 10.1 using digitized NOAA Nautical Charts or geo-referenced aerial photographs provided by The Maine Office of GIS (NAIP_2013).

On June 24, 2016 Maine Department of Marine Resources (MDMR) Scientists Jon Lewis, Marcy Nelson, and Flora Drury visited the proposed suspended aquaculture lease site located in Home Harbor, north of Pleasant Island in the Muscle Ridge Islands.

General Characteristics

The proposed lease area, if granted, would occupy 3.66 acres within Pleasant Island's Home Harbor (see below: Positions and Distances to Shore). The applicant is requesting to culture American/Eastern oysters in 900 floating OysterGro™ cages and sea scallops in 300 "aquatray stacks" upon the ocean floor.

Existing Aquaculture Gear (ATW 315 and ATW415)

On June 24, 2016, 15 OysterGro™ cages and one line of ear-hung scallops were observed adjacent to a work float near the proposed lease site (Images 1 and 2). Additionally, MDMR scientists observed one aquatray stack on the ocean floor that was tipped over at the time of visitation (Image 4). Spat collector bags were observed adjacent to the aquatray stack. These spat collector bags were bundled together and anchored to the ocean floor. Substantial deterioration of the outer mesh bags was observed.

Depth

MDMR staff arrived on site at 10:48 am and collected depths at that time. The tide was in the early flood stage. The predicted time of low tide at Owls Head, Maine on June 24, 2016 was 8:14 am. Tidal height was predicted at 0.31 feet below mean low water (MLW).

At the time of the Department's site assessment the proposed lease site sat in 11'-27' of water with the deepest depths found in the northern and eastern portions of the site. Correcting for tidal range would derive water depths approximately 6 feet higher at high tide (17'-33') and water depths approximately 4 feet lower at low tide (7'-23').

Owls Head, Penobscot River, Maine**

(44.100° N, 69.0500° W)

Date	Time	Height (ft)
6/24/16	01:49 AM	10.49 H
6/24/16	08:14 AM	-0.31 L
6/24/16	02:28 PM	09.62 H
6/24/16	8:27 PM	00.72 L

** <http://tbone.biol.sc.edu/tide/tideshow.cgi?site=Owls+Head%2C+Penobscot+River%2C+Maine&units=f>

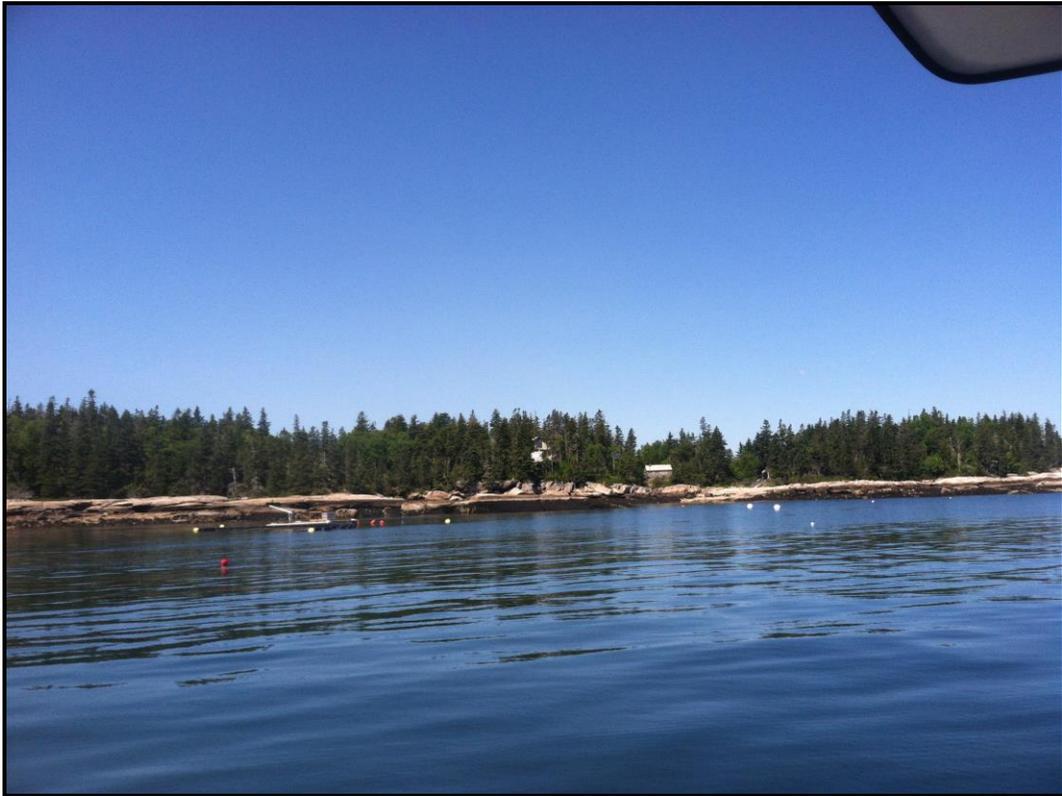


Image 1: Photograph of proposed lease site in Home Harbor, facing south towards Pleasant Island (June 24, 2016).



Image 2: Photograph of float barge, davit, and OysterGro™ cages present on existing LPA, facing north towards Hewett Island (June 24, 2016).



Image 3: Underwater view of American lobster on bottom within proposed lease area (June 24, 2016).



Image 4: Underwater view of overturned aquatray stack (June 24, 2016).

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 10.1, digitized NOAA Nautical Charts, digital orthophotography provided by the Maine Office of GIS, and the application coordinates.

Application Coordinates – 3.657 acres (Figure 2)

<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>
N	43° 58' 58.70"N	69° 04' 29.20"W then 361.03 feet at 126.48° True to
E	43° 58' 56.58"N	69° 04' 25.23"W then 437.50 feet at 215.21° True to
S	43° 58' 53.05"N	69° 04' 28.68"W then 354.10 feet at 303.89° True to
W	43° 58' 55.00"N	69° 04' 32.70"W then 453.72 feet at 34.33° True to N Corner.

Approximate Distances to Shore (Figures 1 & 2)

S Corner to Nearest Point, Pleasant Island (MLW)	~109 feet to the southeast
W Corner to Nearest Point, Pleasant Island (MLW)	~65 feet to the southwest
Western Boundary to Home Harbor's Western Shoreline (MLW)	~220 feet to the west
N Corner to Nearest Point, Hewett Island (MLW)	~1,063 feet to the north
E Corner to Nearest Point, Pleasant Island (MLW)	~390 feet to the southeast
"M" Buoys (2)	~63 and ~95 feet to the west
Moorings (2)	Within Site
Mooring	~133 feet to the northwest

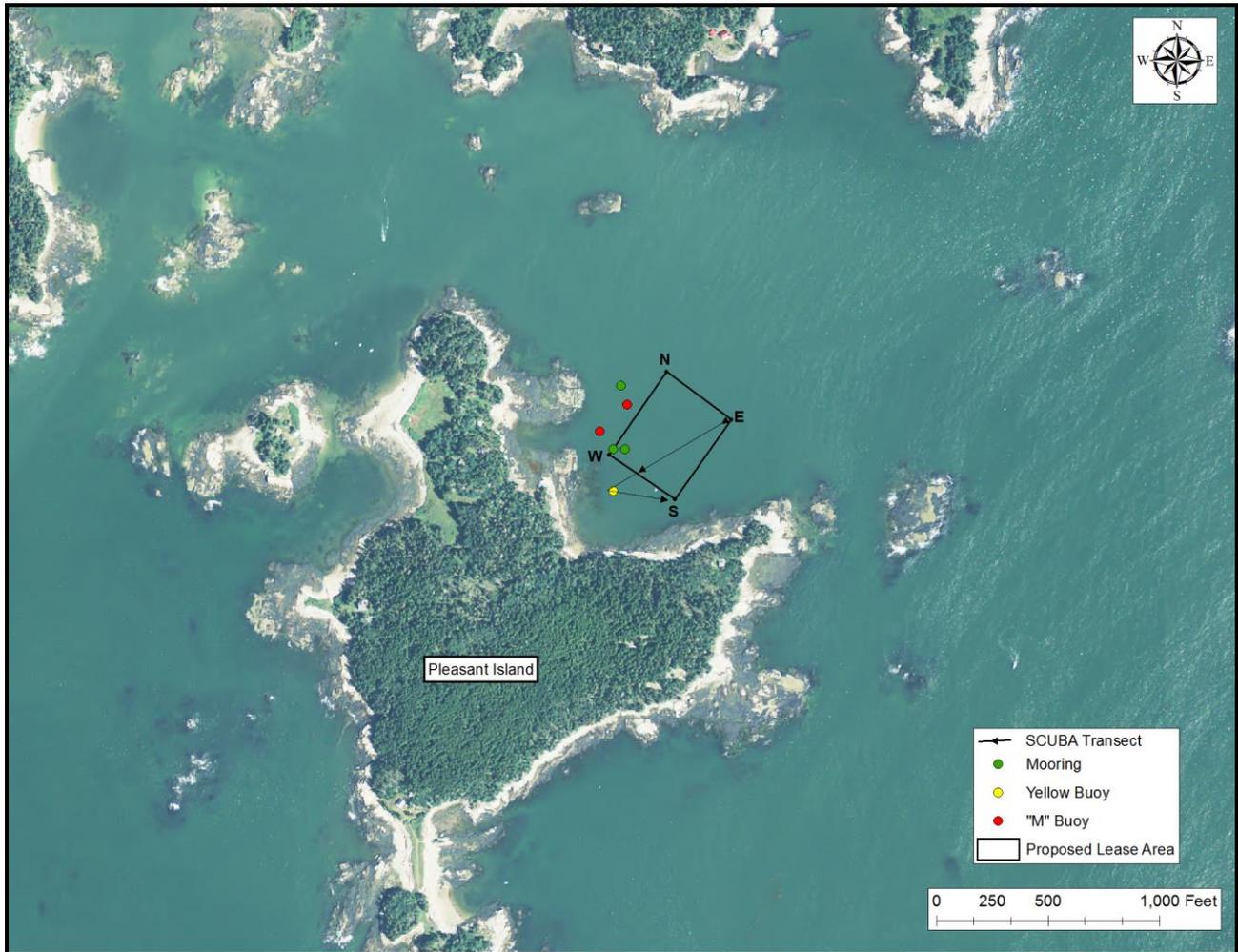


Figure 2* Vicinity Map

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

(1) Riparian Ingress and Egress

Pleasant Island is divided into two lots and owned privately. On June 24, 2016, three buildings were observed along the shores of Home Harbor. Although no docks were seen within Home Harbor at this time, one boat on an outhaul was observed southwest of the proposed lease site. Entry and exit to and from this outhaul would be altered but not prevented by the proposed lease site. Navigation to this outhaul would be possible from the northeast, where ~109 feet (MLW) would be available for transit between the lease and the eastern shoreline of Home Harbor, and from the northwest, where ~220 feet (MLW) would be available for transit between the lease site and the western shoreline.

A beach with a shoreline walkway lies west of the proposed site. Ingress and egress to this beach from the ocean would be possible with the proposed lease site as the site would be located ~220 feet (MLW) from the western shore of Home Harbor.

Three moorings were observed in Home Harbor at the time of the MDMR site visit. Two mooring balls were located within the proposed lease area and a third mooring ball was located ~133 feet to the northwest (Figure 2). Two buoys labeled with the letter “M” were also observed. These were both within <100 feet of the lease site.

(2) Navigation

The proposed lease activities are not expected to interfere with navigation in the general vicinity. Although the channel north of Pleasant Island and south of Hewett Island is navigated for both commercial and recreational purposes, boats transiting this area will not be negatively impacted by the presence of the proposed lease at any tide. The site is located greater than 1,065 feet from Hewett Island at Mean Low Water (MLW) while another location in the same channel provides only ~495 feet (MLW) between Pleasant Island and ledges south of Hewett Island.

The proposed lease would likely alter but not prevent navigation within Home Harbor. The southern corner of the proposed lease site sits ~109 feet from Pleasant Island at Mean High Water (MLW) and the western corner sits ~65 feet from Pleasant Island (MLW). Boats transiting into the eastern portion of home harbor would be impacted but not prevented from reaching their destination. Using Home Harbor as an anchorage would be made substantially more difficult if the proposed lease were granted.

(3) Fishing

On June 24, 2016 approximately 25 lobster (*Homarus americanus*) pot buoys belonging to at least three different lobstermen were observed within Pleasant Island’s Home Harbor. Approximately 15 of these lobster pot buoys were located within the proposed lease area. Upon examining the site via dive transect, MDMR scientists observed that the high number of lobster pot buoys were accompanied by a high density of American lobster (*Homarus americanus*). At full development the proposed lease would prevent commercial lobstermen from setting lobster traps within its boundaries and would diminish their ability to operate in Home Harbor.

No other commercial or recreational fishing activities were observed in the immediate vicinity, although recreational fishing could occur from shore and by boat in the area. Except within its immediate footprint, the proposed lease, if granted, will not hinder recreational fishing in the area.

(4) Other Aquaculture Uses

The names and distances to the DMR leases and Limited Purpose Aquaculture (LPA) licenses nearest the proposal are listed below (Figure 3). Distances were measured, straight-line, in ArcMap 10.1. Wm. Darrald Atwood, a member of The Maine Mariculture Company, LLC currently has two limited purpose aquaculture licenses located in Pleasant Island’s Home Harbor. **ATW315** is located ~102 feet southwest of the proposed lease site and **ATW415** is located ~30 feet to the southwest of the proposed lease site. Both LPAs are for the culture of blue mussels, American/eastern oysters, and sea scallops. See Figure 3 for a graphic representation of surrounding aquaculture activities.

Given the distance between locations, the proposed activities are unlikely to impact existing aquaculture operations in the area.

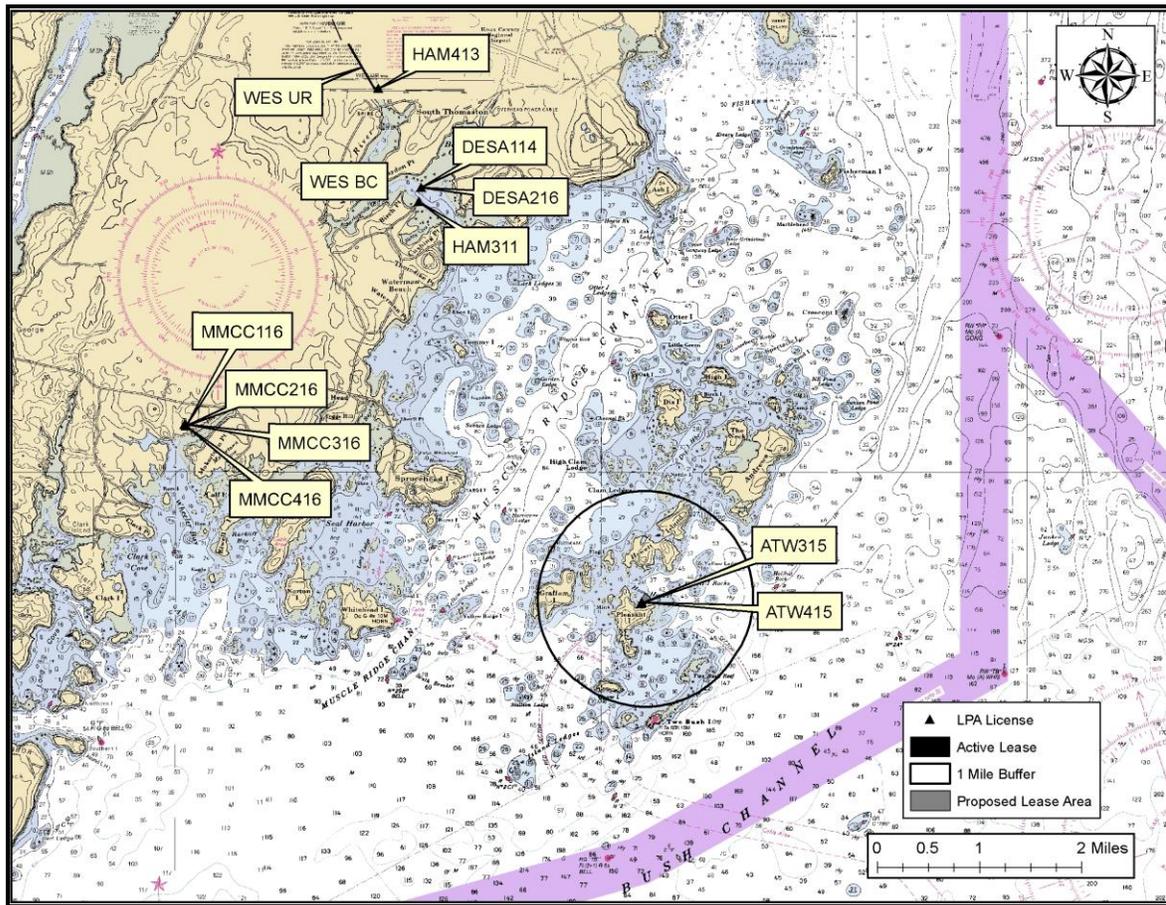


Figure 3*

(5) Existing System Support

Pleasant Island is a small, sparsely developed island located in the southern portion of the Muscle Ridge Islands. The shoreline of Home Harbor, in which the proposed lease site is located, is mostly composed of large rocky outcroppings with a sand beach on the west side of the cove and a pebble beach on the cove's south shore. Upland of the shoreline is dominated by evergreen trees.

On June 24, 2016, a handheld digital video camera contained within an underwater housing was used to document the epibenthic ecology of the surrounding area. The sea bottom within the proposed lease area is primarily sandy with the eastern corner containing some large rocks and dense deposits of mussel shells. MDMR examined the proposed site starting at the eastern corner and proceeding at an approximate bearing of 240°M beyond the southwestern boundary, and then roughly 120°M towards the southern corner (Figure 2). The sea bottom near the eastern corner is dominated by rocks and sugar kelp (*Saccharina latissima*) which gives way to a flat sandy/firm mud bottom with scattered rocks and kelp throughout the center of the site. The presence of macro-flora decreased in the southern portion of the proposed lease site but returned again south of said site.

American lobsters (*Homarus americanus*) were seen commonly within the proposed lease site, and were present in higher density on the sand and hard mud bottom within the central portion of the site. Hermit crabs (*Pagurus sp*) were also abundant throughout the proposed lease area.

Other species observed include:

Rock crab (*Cancer sp.*) - occasional
Barnacles (*Balanis sp.*) - occasional
Sea colander (*Agarum sp*) - common
Filamentous brown seaweeds (*Phylum Phaeophyta*) – common
Filamentous red seaweeds (*Phylum Rhodophyta*) – occasional
Dulse (*Rhodymenia palmata*) - occasional
Brushy Red Weed (*Cystoclonium purpureum*) - occasional
Crustose Algae (*Phylum Rhodophyta*) - occasional
Tortoiseshell Limpet (*Acmaea testudinalis*) - occasional
Periwinkle (*Littorina sp.*) - occasional
Eelgrass (*Zostera marina*) - rare
Rockweed (*Fucus sp*) - rare
Sea Lettuce (*Ulva lactuca*) - rare
Irish Moss (*Chondrus crispus*) – rare
Laver (*Porphyra sp.*) – rare

Eelgrass (*Zostera marina*)

According to data collected by the Maine Department of Marine Resources, there are historical records of eelgrass within the general vicinity of the proposed lease site. In 2010, the Department assessed Home Harbor to contain three patches of eelgrass; two of these patches displayed 10%-40% cover while the third displayed 40%-70% cover (Figure 4).

Eelgrass was seen during the Department's site assessment on June 24, 2016 with an estimated 10%-20% cover. During the Department's SCUBA assessment eelgrass was first encountered ~125 feet to the south of the proposed lease area near the yellow buoy described above and pictured in Figure 2..

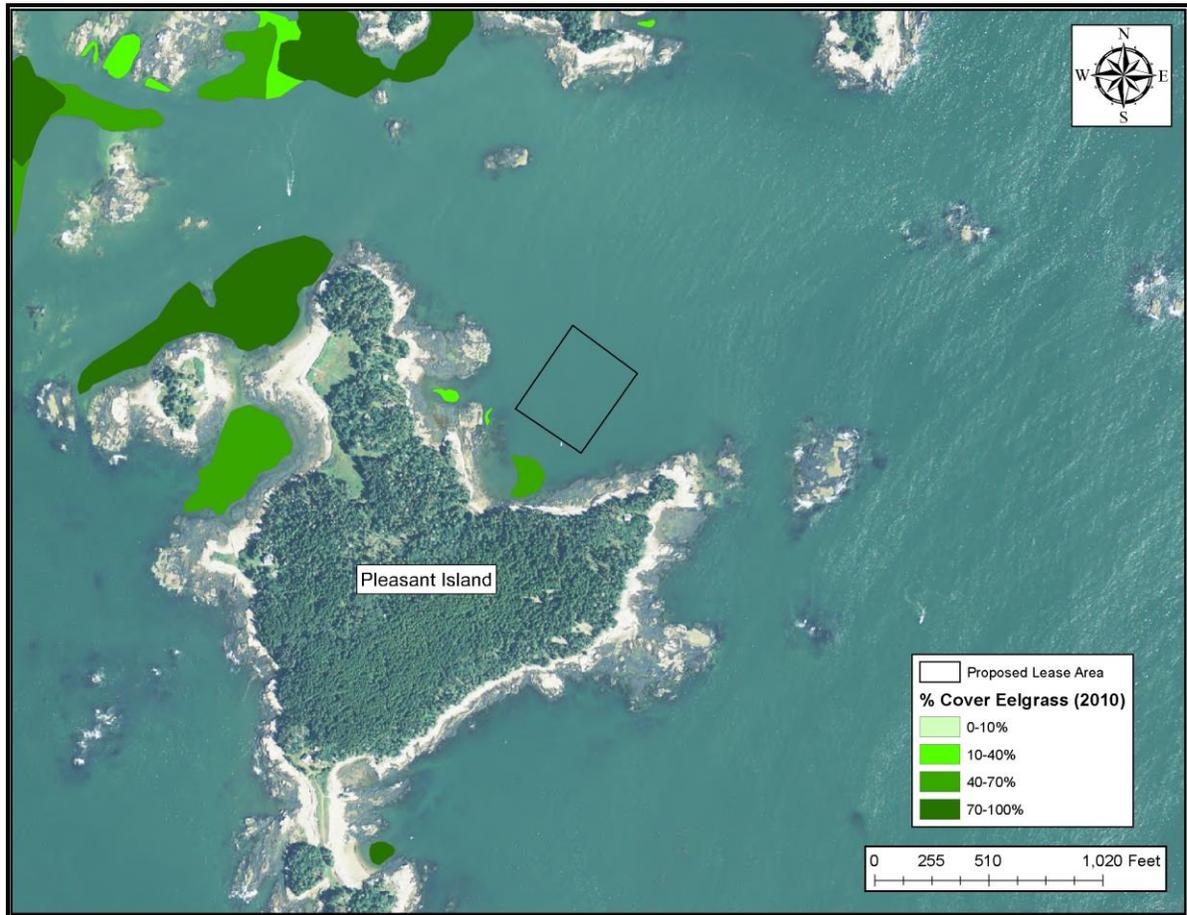


Figure 4* Eelgrass cover (2010 data) nearby proposed lease area

Wildlife

Wildlife seen from the boat while inspecting the area included Harbor seals (*Phoca vitulina*) and Ospreys (*Pandion haliaetus*). One osprey nest was observed on Pleasant Island south of the proposed lease site.

A request for review and comment was sent to the Maine Department of Inland Fisheries and Wildlife (MDIF&W) on January 30, 2016. At the time of this report MDMR had not received a response. According to GIS (Geographic Information System) data maintained by MDIF&W and available through the Maine Office of GIS, there are no Essential or Significant Wildlife Habitats within Home Harbor. The northeastern shore of Pleasant Island is categorized as moderate to high value Tidal Wading Bird and Waterfowl Habitat.

(6) Interference with Public Facilities

There are no public facilities within 1,000 feet of the proposed lease. The nearest publicly-owned land to the proposed lease site is Two Bush Island, part of the Petit Manan National Wildlife Refuge, which is ~1.06 miles away.

(7) Water Quality

The area of the proposed lease site is currently classified as open/approved for the harvest of shellfish.

(8) Lighting

The applicant does not plan to install lighting at the proposed site, if granted.

(9) Noise

The applicant may use a low-power battery or a small gasoline engine to power an oyster grading machine or powered winch. The applicant states that this equipment will be used infrequently between May and November and will not require noise control.

(10) Visual Impact

The OysterGro™ cages proposed for this lease will each measure 6' LX 4' WX 1.5' H and be suspended below the ocean surface with two black plastic floats that would sit 1' in height above the surface of the water. When periodically placed in the drying position, to control fouling, the cages will rest on the plastic pontoons and protrude approximately 20" above the surface of the water. In the winter operators plan to sink the OysterGro™ cages to the ocean floor; only marker buoys will be visible at this time.

The aquatray stacks proposed for this lease, measuring 10 feet in height and containing up to 24 trays per stack, will be completely submerged. Buoys for floatation and a rope or chain transverse line to connect these aquatray stacks will be visible from the surface.

One 12' x 24' float barge will sit 2' above the water's surface. This float will house a 96" davit.