**Location:** East of Little Chebeague Island, Towns of Chebeague and Long Islands, Casco Bay, Cumberland County, Maine

**Purpose:** Standard lease for the suspended culture of sugar kelp (*Saccharina latissima*), skinny kelp (*Saccharina angustissima*), horsetail kelp (*Laminaria digitata*), winged kelp (*Alaria esculenta*), dulse (*Palmaria palmata*), Irish moss (*Chondrus crispus*), and laver (*Porphyra sp.*)

Site Review by: Jon Lewis, Marcy Nelson and Flora Drury
Report Preparation by: Flora Drury, Marcy Nelson, Cheyenne Adams, and Jon Lewis
Report Submitted on: April 29, 2020

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1 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 (OrthoCoastalCascoBay2018).

2 In the application (page 2), skinny kelp was referred to as a morphotype of *Saccharina latissima* (*Saccharina latissima forma angustissima*). Skinny kelp is now considered a separate species (*Saccharina angustissima*) and will be referred to in this report as such.
Application Overview

The applicant, Shearwater Ventures, LLC, is requesting 3.83 acres east of Little Chebeague Island in Casco Bay for the suspended culture of sugar kelp (Saccharina latissima), skinny kelp (Saccharina angustissima), horsetail kelp (Laminaria digitata), winged kelp (Alaria esculenta), dulse (Palmaria palmata), Irish moss (Chondrus crispus), and laver (Porphyra sp.) (Figures 1 & 2). The applicant proposes to culture marine algae on up to fifteen, one-thousand-foot horizontal longlines suspended approximately four feet below the surface of the water. At a minimum, the applicant proposes a ten-foot gap between the deployed longlines. Longlines, depth control lines, and spreader lines would be onsite October 15th through June 15th, annually. Ten helical anchors, six 2,000-pound gravity anchors, and thirty-six associated mooring lines and buoys, would remain on the site throughout the year. The proposal is within the footprint of, and would replace, the applicant’s experimental lease CAS ELCx; CAS ELCx is permitted for the suspended culture of marine algae.

Maine Department of Marine Resources (MDMR) staff Jon Lewis, Marcy Nelson, and Flora Drury assessed the proposed lease site on November 21, 2019.

Figure 2: Proposed lease area with approximate drop camera transects conducted on November 21, 2019.

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3 Applicant originally requested 3.79 acres. DMR calculations, based on the coordinates provided by the applicant, indicate the area is 3.83 acres.
4 Application, pages 10 & 11
5 Application, pages 8, 9, & 20
6 Application, pages 10-13
Site Characteristics

The proposed lease occupies subtidal waters in Chandler Cove, a protected waterbody surrounded by Great Chebeague, Little Chebeague, and Long Islands (Figure 1, Images 1-6). Little Chebeague Island, an unpopulated island owned by The State of Maine Bureau of Parks and Lands, is located to the west of the proposed lease site (Images 1-3). A tidally-exposed sand bar connecting Great Chebeague and Little Chebeague Islands is located to the north of the site. The shore frontage on Great Chebeague Island to the north and northeast of the proposed lease is residential and dominated by fields and a mixed forest. Docks and moorings are located in the head of Chandler Cove on Great Chebeague Island to the northeast of the proposed lease (Image 6).

Image 1: Looking northwest at Little Chebeague Island and existing lease CAS ELCx from S Corner of proposed lease site (November 21, 2019).
Image 2: Looking west at Little Chebeague Island from S Corner of proposed lease site (November 21, 2019).

Image 3: Looking southwest from the S Corner of the proposed lease site (November 21, 2019).
Image 4: Looking south at Long Island from S Corner of the proposed lease site (November 21, 2019).

Image 5: Looking east from S Corner of proposed lease site (November 21, 2019).
Depth

During MDMR’s 2016 site assessment of the applicant’s existing experimental lease CAS ELCx, which is located in the same area as the current proposal, water depths ranged from 24 to 35 feet, with deeper water found at the southern and eastern portions of the lease. In the CAS ELCx site report, MDMR staff calculated a minimum water depth of approximately 20 feet within the boundaries of the lease when correcting to mean low water.\(^7\)

Bottom Characteristics

Although existing lease CAS ELCx is permitted for the deployment of marine algae longlines seven feet beneath the surface of the water, longlines were observed at shallower depths during MDMR’s site visit on November 21, 2019 and multiple lines were observed floating at the surface. Due to these hazards, MDMR was unable to conduct a SCUBA or drop camera transect within the boundaries of the proposed lease. MDMR staff instead observed the bottom characteristics of the adjacent area via drop camera transects around the boundary of the proposal (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 taken, or grain size analysis performed. The bottom of the proposed lease site immediately outside the lease boundaries is primarily composed of semi-firm mud and sand with the occasional presence of gravel. Firmer sediment was observed along the eastern boundary of the site, and softer sediment was observed on the western boundary (Figure 2 & Images 7-8).

\(^7\) Shearwater Ventures Site Report #2016-03E. Published July 18, 2016.
Table 2: Bottom characteristics observed during drop camera transects conducted on November 21, 2019.

<table>
<thead>
<tr>
<th>Substrate Origin</th>
<th>Substrate Class</th>
<th>Substrate Subclass</th>
<th>Substrate Group and Subgroup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geologic Substrate</td>
<td>Unconsolidated Mineral Substrate</td>
<td>Fine Unconsolidated Substrate</td>
<td>Slightly Gravelly Sandy Mud</td>
</tr>
</tbody>
</table>

Images 7 & 8: Sediments observed in drop camera transects conducted on November 21, 2019.

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, digitized NOAA Nautical Charts, digital orthophotography provided by the Maine Office of GIS, and the application coordinates.
Application Coordinates – 3.83 acres (Figure 2)

<table>
<thead>
<tr>
<th>Corner</th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>43° 42’ 50.60” N</td>
<td>70° 08’ 30.31” W then 154.38 feet at 119.47° True to</td>
</tr>
<tr>
<td>NE</td>
<td>43° 42’ 49.85” N</td>
<td>70° 08’ 28.48” W then 1095.63 feet at 208.38° True to</td>
</tr>
<tr>
<td>S</td>
<td>43° 42’ 40.33” N</td>
<td>70° 08’ 35.57” W then 150.01 feet at 298.20° True to</td>
</tr>
<tr>
<td>SW</td>
<td>43° 42’ 41.03” N</td>
<td>70° 08’ 37.37” W then 1099.04 feet at 28.15° True to N.</td>
</tr>
</tbody>
</table>

Table 3: Approximate distances from proposed lease to surrounding features (Figures 1 & 2). Measurements were made using digital orthophotography provided by the Maine Office of GIS (orthoCoastalCascoBay2018).

<table>
<thead>
<tr>
<th>Feature</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Corner to nearest point, Little Chebeague Island (MLW)</td>
<td>~180 feet to the northwest</td>
</tr>
<tr>
<td>NE Corner to Green Can “3” (NOAA Chart)</td>
<td>~2,120 feet to the southeast</td>
</tr>
<tr>
<td>S Corner to nearest point, Long Island (MLW)</td>
<td>~1,450 feet to the southeast</td>
</tr>
<tr>
<td>S Corner to Green Can “5” (NOAA Chart)</td>
<td>~1,200 feet to the southeast</td>
</tr>
<tr>
<td>SW Corner to nearest point, Little Chebeague Island (MLW)</td>
<td>~230 feet to the northwest</td>
</tr>
<tr>
<td>SW Corner to Ren Nun “6” (NOAA Chart)</td>
<td>~1,370 feet to the southwest</td>
</tr>
</tbody>
</table>

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

(1) Riparian Ingress and Egress

Little Chebeague Island is the only shorefront parcel within 1,000 feet of the proposed lease. This uninhabited island is owned by the Maine Bureau of Parks and Lands and is open to public access. Individuals access the island by foot over a tidally exposed sandbar connecting Great Chebeague and Little Chebeague Islands or by landing vessels directly on the island’s shoreline. The proposed lease area is approximately 180 feet from Little Chebeague Island at mean low water, and therefore boat access to the Little Chebeague Island shoreline would not be prevented.

On November 21, 2019 no docks or shorefront residences with which the proposed activities would interfere were observed. The proposed lease is located approximately 1,650 and 2,400 feet from the Long Island and Great Chebeague Island uplands, respectively.

(2) Navigation

The proposed lease area is located to the west of the primary navigation channel in Chandler Cove (Figure 1). Although Chandler Cove experiences heavy boating traffic, including a ferry route, the proposed location is outside of the navigation channel and parallel to the Little Chebeague Island shoreline, and therefore minimizes interference with boat traffic in the channel. The proposed lease location does not impede on the highwater cut-through between
Little and Great Chebeague Islands, as it is located over 1,000 feet to the south of this tide-dependent route. Additionally, because the proposed lease is located a minimum of 180 feet to the southeast of Little Chebeague Island at mean low water, there is adequate room for vessels to maneuver between the proposed lease and the island. Vessels navigating in the area would also be able to transit between the proposed lease, if granted, and aquaculture lease CAS CHANx, as it is located approximately 305 feet to the northeast of the proposal (Figure 3).

It should be noted that during the site visit conducted on November 21, 2019, MDMR inspected the applicant’s current operations and observed marine algae longlines both floating and submerged just a few feet below the water’s surface. The applicant’s existing lease, CAS ELCx, is permitted to deploy marine algae longlines seven feet below the surface of the water. The inconsistent depth of longline deployment and number of depth control buoys floating at the surface (Image 1) pose a hazard to navigation in the area. The current application proposes longlines suspended four feet below the surface of the water. If longlines are maintained at this depth, shallow draft vessels would theoretically be able to maneuver over these lines unimpeded. However, it is likely that the area would be avoided altogether when horizontal longlines are deployed due to the presence of depth control buoys.

(3) Fishing and Other Water-Related Uses

MDMR staff did not note any commercial or recreational fishing activity in the vicinity of the proposed lease during their site visit on November 21, 2019. However, because lobster buoys were used for the depth control lines on existing lease CAS ELCx, it is possible that some lobstering activity was missed by MDMR staff (Image 9). Lobstering activity has been observed in the general area of the proposed lease during previous visits to Chandler Cove. It is possible that lobster fishing could occur in the proposed lease area, if granted, during the summer months, as the horizontal longlines are proposed to be removed from the site from June 16th to October 14th, annually.

What was presumed to be a lobster buying station with two boats tied up was noted to the south of the proposal on November 21, 2019 (Image 3). The distance between the lobster buying station and the proposed lease appears adequate to prevent interference to this existing business.

In a Harbormaster Questionnaire filled out in response to another lease application in the area, the Chebeague Island Harbormaster indicated that Chandler Cove is used regularly by recreational and commercial fishermen during their respective seasons. According to the Harbormaster, commercial activities include lobster and scallop fishing. MDMR scallop harvester reports indicate that scallops have been caught in almost all of Chandler Cove, with greater catch rates in the cove’s deeper waters. Additionally, multiple sea scallops (Placopecten magellanicus) were observed in drop camera footage taken along the bounds of the proposal on November 21, 2019 (Image 12).

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8 CAS ELCx
9 Harbormaster Questionnaire completed for Great Ledge Cove Seafood, LLC application on July 17, 2017.
10 Harbormaster Questionnaire, July 17, 2017
11 Communication with MDMR staff Kevin Kelly, Joe Wodjenski, and Mike Kersula during the preparation of the Shearwater Ventures Site Report #2016-03E. Published July 18, 2016.
Recreational fishing is expected to occur from shore and by boat in the area during the summer months. Except within its immediate footprint, the proposed lease will not hinder recreational fishing.

**Image 9:** Lobster buoys used as depth-control buoys on CAS ELCx (November 21, 2019).

(4) **Other Aquaculture Uses**

There are eight active aquaculture leases and seven Limited Purpose Aquaculture (LPA) licenses located within 1 mile of the proposed lease site (Figure 3). The proposal overlaps with the applicant’s existing experimental lease, CAS ELCx, which will expire when a decision is reached on this application. The closest aquaculture operation held by an individual other than the applicant is CAS CHANx, an experimental lease for the suspended culture of marine algae located approximately 305 feet to the northeast. CAS CHANx was granted after CAS ELCx.
(5) Existing System Support

On November 21, 2019, MDMR staff assessed the epibenthic ecology of the surrounding area by drop camera (Figure 2). Semi-firm mud and sand were observed.

Epibenthic macro flora and fauna observed in the highest abundance during the drop camera transect include marine algae, colonial tunicates, and benthic diatoms (Images 10 & 11). Drop camera footage also showed multiple sea scallops (*Placopesten magellanicus*) along the bounds of the proposal (Image 12).
Image 10: Colonial tunicates observed in video transects conducted on November 21, 2019.

Image 11: Benthic diatoms observed in video transects conducted on November 21, 2019.

Image 12: Sea scallop observed in video transects conducted on November 21, 2019.
Eelgrass (*Zostera marina*)

According to historic data collected by the Casco Bay Estuary Project (2018) eelgrass is present, in varying levels of coverage, around the majority of Little Chebeague Island. The proposed lease site is located a minimum of 50 feet to the east of these documented beds (Figure 4). Drop camera footage collected during the November 21, 2019 site assessment showed dead eelgrass present along the bounds of the proposal (Images 13 & 14). Although the majority of the eelgrass appears to have washed into the area from nearby beds, it is also possible that some of the eelgrass grew in the proposed lease area. However, because the applicant has been in operation in the proposed location since 2016, if eelgrass has spread into the proposed lease boundaries since the eelgrass survey conducted in 2018, it appears to have done so in the presence of the current operations. Additionally, the proposed lease operations outline a period of inactivity during the majority of the eelgrass growing season, and therefore if any eelgrass is growing within the proposed lease, shading concerns are minimized.

![Figure 4: Historical records of eelgrass (*Z. marina*) in the vicinity of the proposed lease site.](image)

Data obtained from MEDEP maintained SDE Feature Class “GISVIEW.MEDEP.Eelgrass2018”

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12 Data obtained from MEDEP maintained SDE Feature Class “GISVIEW.MEDEP.Eelgrass2018”
Wildlife

According to GIS (Geographic Information System) data maintained by MDIF&W and available through the Maine Office of GIS, the proposed lease is located more than 80 feet to the east of Tidal Wading Bird and Waterfowl Habitat (Figure 5). This habitat is defined under Maine’s Natural Resources Protection Act (NRPA) as Significant Wildlife Habitat. Additionally, there is MDIFW designated habitat for purple sandpipers (*Calidris maritima*) over 1,000 feet to the southeast of the proposed lease.

In an email dated October 9, 2019, Becca Settele, a Wildlife Biologist for MDIF&W, stated “As there are no apparent direct impacts to wildlife resources under MDIFW jurisdiction, we have no comment on this project”.

**Image 13:** Dead eelgrass observed in video transects conducted on November 21, 2019.

**Image 14:** Dead eelgrass observed in video transects conducted on November 21, 2019.
Figure 5: Tidal Wading Bird and Waterfowl Habitat\textsuperscript{13} and Endangered, Threatened, or Species of Special Concern Habitat\textsuperscript{14} near the proposed lease site.

(6) Interference with Public Facilities

Little Chebeague Island, which is owned by The Maine Department of Agriculture, Conservation, and Forestry, Bureau of Parks and Lands, is located approximately 180 feet to the northwest of the proposed lease at mean low water (Figure 6). Little Chebeague Island is accessible by foot from Great Chebeague Island via a sandbar exposed at low tide. Access to the island from the water requires anchoring in the shallows offshore or landing vessels directly on the shoreline. Recreational boaters, kayakers, and beachgoers regularly use the island. Due to its location and proximity to Little Chebeague Island, the proposed lease area is unlikely to obstruct access to or use of this public facility.

\textsuperscript{13} Data obtained from MDIWF maintained SDE Feature Class “GISVIEW.MEIFW.Twwh”

\textsuperscript{14} Data obtained from MDIWF maintained SDE Feature Class “GISVIEW.MEIFW.ETSC”
Figure 6: Conserved land near the proposed lease site.

(7) Lighting

According to the application, lights will not be used on the proposed lease.\textsuperscript{15}

(8) Noise

The applicant proposes to use an 18-foot skiff to access the site. During harvest, a lobster boat is also proposed.\textsuperscript{16} The size and type of vessels proposed are consistent with those regularly used for commercial and recreational purposes along the Maine coast. Additionally, the applicant proposes to use a gas-powered pot hauler and a portable generator on the lease, sizes of which were not provided in the application.\textsuperscript{17}

(9) Visual Impact

The aquaculture equipment and vessels proposed for use, should the lease be granted, meet the height limitations as set forth in MDMR Regulation Chapter 2.37(A).

\textsuperscript{15} Application, page 21
\textsuperscript{16} Application, page 20
\textsuperscript{17} Application, page 21