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# Shellfish Resources and Habitat Characterization Survey for Sebasco Harbor, Phippsburg, Maine

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# SHELLFISH RESOURCES AND HABITAT CHARACTERIZATION SURVEY FOR SEBASCO HARBOR, PHIPPSBURG, MAINE

***Prepared for***

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## Introduction

The Sustainable Shellfisheries Working Group of the Casco Bay Estuary Project (CBEP) has been identifying and evaluating potential ways to improve access to shellfish resources by systematically eliminating the few remaining closures to the harvesting of shellfish, both intertidal and subtidal, that exist around the Bay. During 2004 several potential areas were selected for further evaluation, including the Sebasco Harbor area, specifically the area between the shoreline adjacent to Sebasco Estates and Harbor Island (refer to Figures 1 and 2).

Previous work water quality assessment work in this area, also carried out under the CBEP Sustainable Shellfisheries Program, indicates that water quality is generally good in the area and meets the standards for Open/Approved status. However, the presence of a licensed overboard discharge (OBD) along the Sebasco Estates shoreline precludes the area from being opened to harvesting, despite the acceptable water quality. Removal and replacement of OBD with a conventional in-ground treatment system, *i.e.* septic system, is possible, but at considerable expense. However, since the Sebasco Harbor area serves as an anchorage to a number of large, potential live-aboard, vessels, even if the existing OBD were removed and replaces, the area might remain closed due to exposure for potential contamination from vessel discharge.

The Food and Drug Administration's (FDA) National Shellfish Sanitation Program (NNSP) provides guidance on the methods and standards that can be used to evaluate the potential risks associated with vessel discharge, specifically determination of flushing rate within the area in question. Such determination requires a description of the bathymetry of the area, calculation of basin volume, determination of tidal prism and volume, tide frequency, and vessel occupancy rates, seasonality, and number of potentially discharging vessels. All of these determinations are time-consuming and therefore expensive, so before proceeding with this level of effort, MER suggested that the SSWG consider doing a resource survey to determine if the existing resource level warranted the additional effort and expenditure.

In June 2004 MER was directed to conduct a limited survey to assess the subtidal shellfish resources and habitat within the area. A diver/video survey was conducted on July 15, 2004; this report summarizes the methods used and the results and conclusions

## Methodology

### Diver/video Surveys

#### a. Transect lines and deployment

For video recording of the bottom, three (3) transect lines measuring 60 meter (~200 ft.), each consisting of a rope marked in 10 m alternating black and white sections, with the exception of the first and last 10 m which are marked as two 5 m sections, the last five of which are marked in alternating 1 m black and white increments, were clipped together to form continuous lines measuring a total of 180 meters (~591 ft.); for ease of deployment, weights were attached to the transect line at the start and end of 180-meter transect line. Geographic position (WGS84) for the start and end of each transect and the one sampling station were determined and recorded using a Garmin 182 GPS Chartplotter corrected by WAAS to an accuracy of ± 3.0-3.5 meters (refer to Table 1 on Page 4).

**Figure 1. Sebasco Harbor (NOAA/NOS Chart No. 13290, Casco Bay, 34th Ed. Feb. 24/01)**

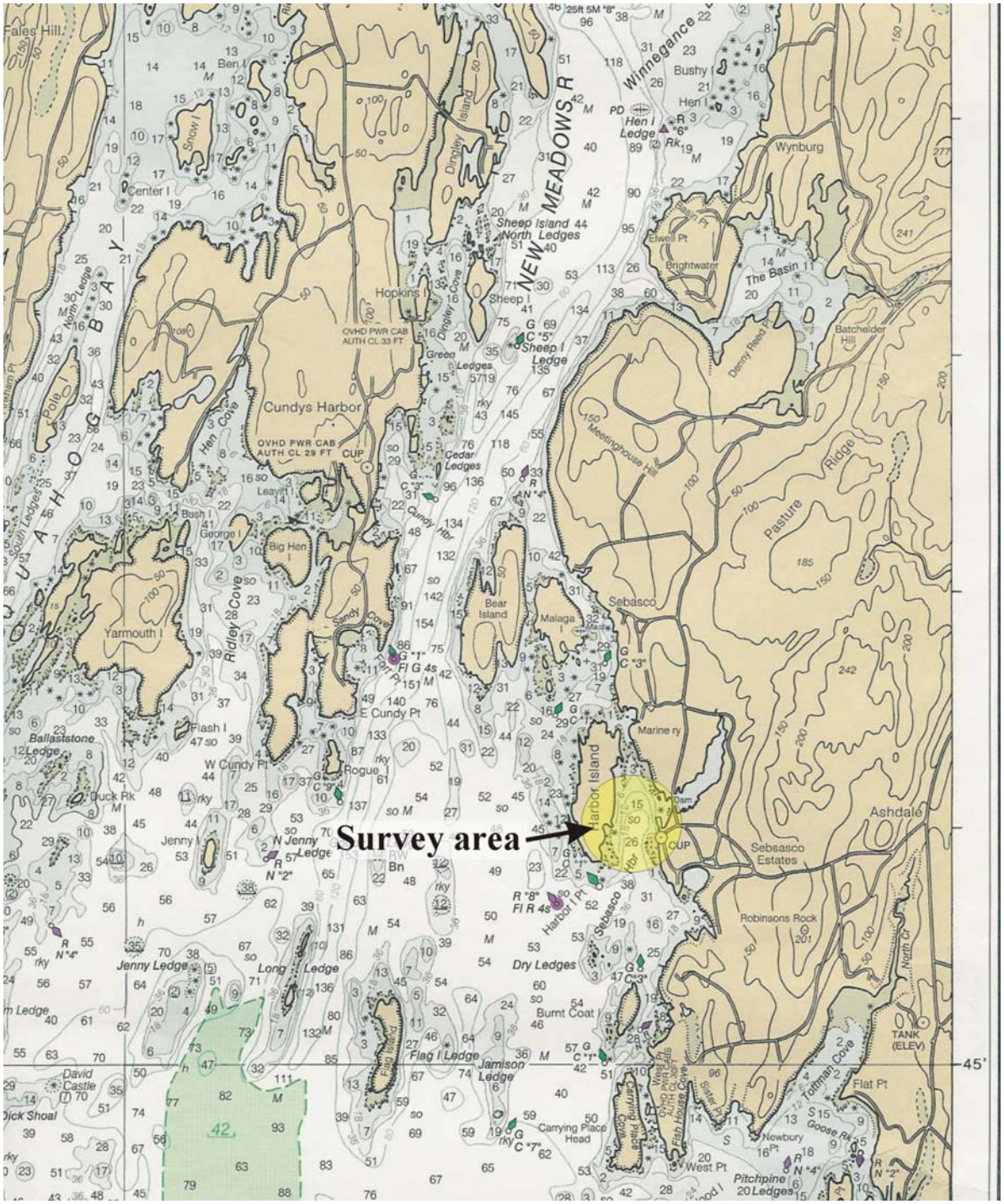
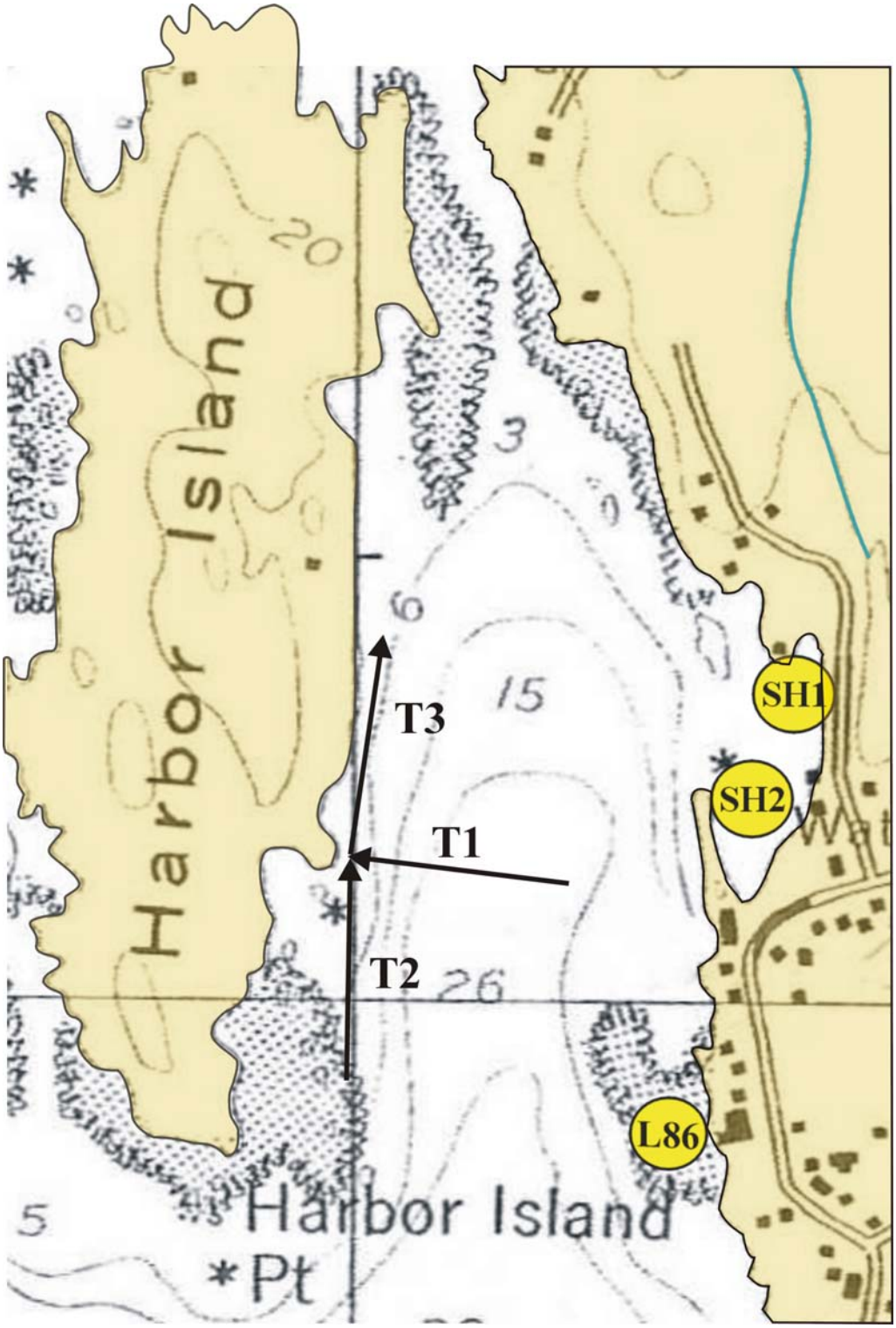


**Figure 2. Detail of Sebasco Harbor anchorage area showing video recording transects deployment locations (T1, T2, and T3).**



### b. Diver survey and video recording

The video recordings were made using an Amphibico VHDB0001/Sony DCR-TRV310 digital video camera package on DV/Hi8 format tapes. Where necessary, lighting was provided by an Amphibico VLAL2550 25W/50W switchable underwater arc lamp.

Three (3) video recordings were made of the bottom at the site: Transect 1 (T1) was deployed perpendicular to the shoreline along the bottom of the anchorage basin from the approximate low water mark [Way Point (WP) 741] to a point where depth reached approximately 8 meters (WP 742), as shown in Figures 2. Transect 2 (T2) was deployed parallel to the shoreline from the shallow ledge area near the southern tip of Harbor Island (WP 745) to the shoreside end of T1 (WP 741). Transect 3 (T3) was deployed parallel to the shoreline within the shallow nearshore area beginning at the end point of T1 (WP 741) northward to WP 750. During recording, the camera was maintained at a distance off the bottom such that the field of view was approximately 1 meter wide, thus allowing flora and fauna density to be estimated on a square-meter ($m^2$) basis, if necessary. A DVD copy of the digital video recordings produced during the surveys accompanies this report.

**Table 1**
**Transect and sampling station location coordinates (WGS84)**

| Transect/Station | MER waypoint | Latitude | Longitude |
|---|---|---|---|
| **T1 start** | **742** | **43º 46’ 00.0”** | **69º 52’ 00.9”** |
| **T1 end** | **741** | **43º 46’ 00.7”** | **69º 52’ 08.7”** |
| **T2 start** | **745** | **43º 45’ 53.9”** | **69º 52’ 08.5”** |
| **T2 end** | **741** | **43º 46’ 00.7”** | **69º 52’ 08.7”** |
| **T3 start** | **741** | **43º 46’ 00.7”** | **69º 52’ 08.7”** |
| **T3 end** | **750** | **43º 46’ 06.5”** | **69º 52’ 07.5”** |

## Observations

### Sediments

The bottom across the Sebasco Harbor basin is generally flat and sediments within are soft silt and covered with a diatomaceous ooze; burrows are found across the area, presumably occupied primarily by lobsters. The bottom rises rather steeply along bedrock/ledge in the subtidal area immediately adjacent to Harbor Island, first from a depth of approximately 15-20 feet MLW to a depth of approximately 12 feet MLW, then from approximately 12 feet MLW to 6-8 feet MLW, thus forming a shelf between the 6-12 foot depths that varies in width from just a few meters to 10-15+ meters; this shelf area is characterized by coarse sand, shell hash and gravel, occasionally covered with a fine layer of silt, found between bare bedrock outcrops.

### Shellfish resources

Blue mussels, *Mytilus edulis*, of relatively low quality (due to their low intertidal/shallow subtidal location) are found in very limited quantities within the shelf area described above. European oysters, *Ostrea edulis*, are also found within the shelf area in greater numbers than mussels, however, with exception of a few isolated individuals, the population is restricted to the gravel, shell hash area at the southern end of Harbor Island. The soft sediments of the basin preclude persistence of shellfish and no shellfish where found within this area.

**Flora and fauna observes**

Flora and fauna seen during the transect dives and on the video recordings are listed in Table 3 below and are shown graphically in Figure 3 through 5 on page 7, 8, and 9, respectively.

**Table 3**
**Summary of diver/video review observed flora and fauna**

| Common name | Scientific name | Relative abundance |
|---|---|---|
| **Flora** | | |
| Unidentified epilithic diatom | ----- | locally abundant in shallows |
| Tufted red weed | *Gigartina stellata* | locally abundant in shallows |
| Dead man's fingers | *Codium fragile* | common low subtidal (not on video) |
| Irish sea moss | *Chondrus crispus* | locally abundant in shallows |
| Sea lettuce | *Ulva lactuca* | occasional/locally common |
| Rockweed | *Ascophyllum* sp., *Fucus* sp. | locally abundant in shallows |
| Kelp | *Laminaria* sp. | locally abundant in shallows |
| | | |
| **Fauna** | | |
| Bread crumb sponge | *Halichondria panicea* | rare |
| Periwinkle | *Littorina littorea* | rare/locally common |
| Blue mussel | *Mytilus edulis* | rare/locally common |
| Horse mussel | *Modiolus modiolus* | rare |
| European oyster | *Ostrea edulis* | occasional/locally common at S |
| Green crab | *Carcinus maenas* | occasional/common |
| Rock crab | *Cancer irroratus* | occasional/common |
| Jonah crab | *Cancer borealis* | rare |
| Hermit crab | *Pagurus* sp. | occasional/locally abundant S |
| American lobster | *Homarus americanus* | occasional/locally abun. in kelp |
| Mysid shrimp | Order Mysidacea | rare/locally abundant |
| Common sea star | *Asterias* spp. | occasional |
| Northern sea cucumber | *Cucumaria frondosa* | rare |
| Orange encrusting tunicate | *Botrylloides* sp. | rare/occasional |
| Sea peach | *Halocynthia* sp. | rare |

The flora and fauna distribution is generally sparse throughout the basin bottom, consistent with the barren, soft sediment conditions that exist across most of the basin that offer little in the way of substrate for sedentary forms. Both flora and fauna increase at the end of Transects 1 and along Transects 2 and 3 within the shallower subtidal area.

Much of the flora consists of weeds, *e.g. Chodrus crispus*, and kelp, *e.g. Laminaria* sp., characteristic of strongly oceanic conditions, as expected given the area's proximity to open ocean. Lobsters, *Homarus americanus*, generally small, sub-legals, are common in areas covered with kelp; the presence of several actively fished lobster traps on Transect 2 indicates that the shallow subtidal area also supports commercial quantities of legal-sized lobsters. Hermit crabs, *Pagurus* sp., are common to abundant along Transect 2 in the same area where European oysters are found, consistent with the coarse sand and shell has sediments found in the area that are preferred by both species. Noticeably absent are sea scallops, *Placopecten magellanicus*, however, even though the generally oceanic conditions would normally provide suitable habitat, the exceptionally soft sediments of the deeper basin apparently preclude their colonizing the area.

**Figure 3. Transect 1**

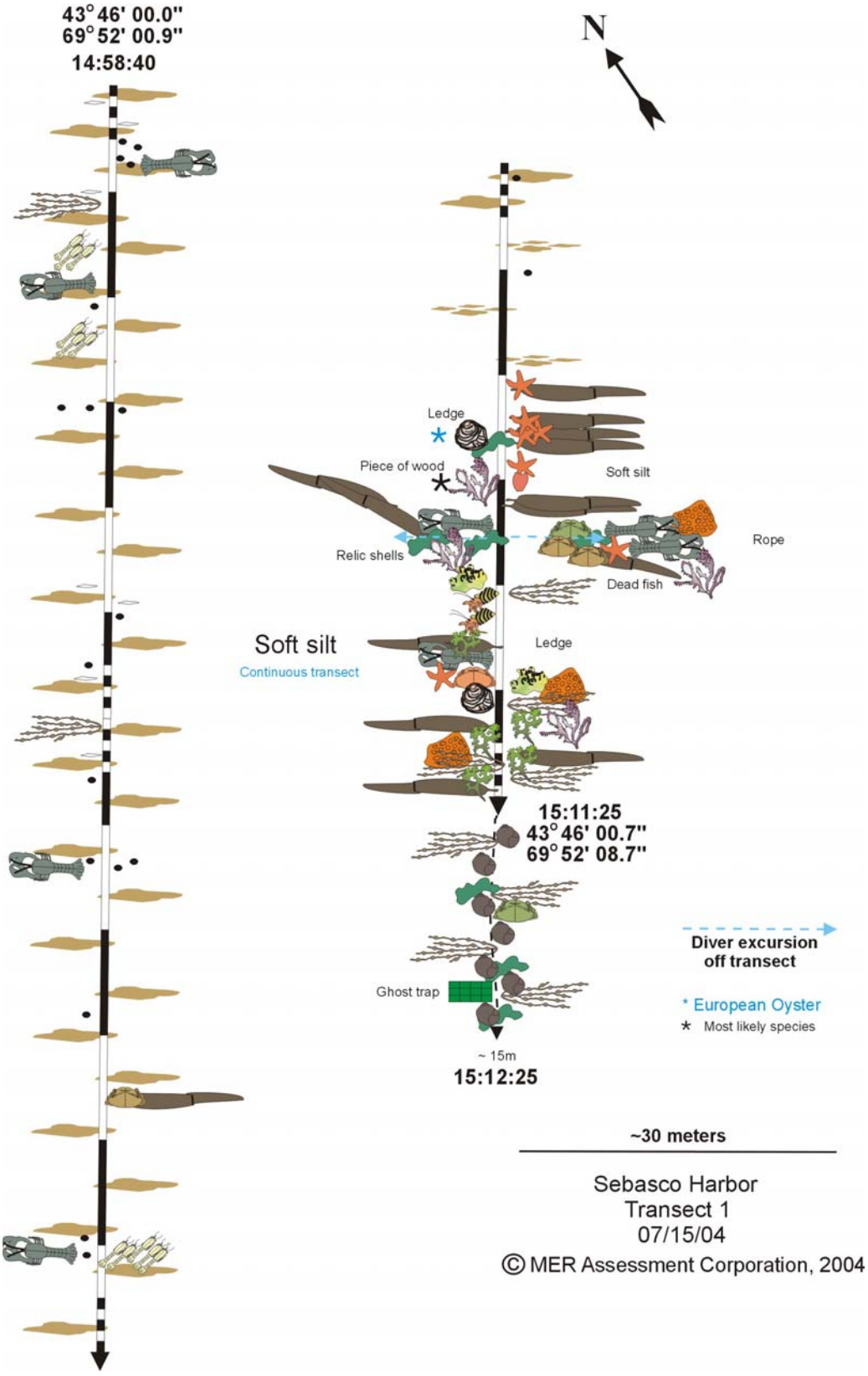


**Figure 4 Transect 2.**

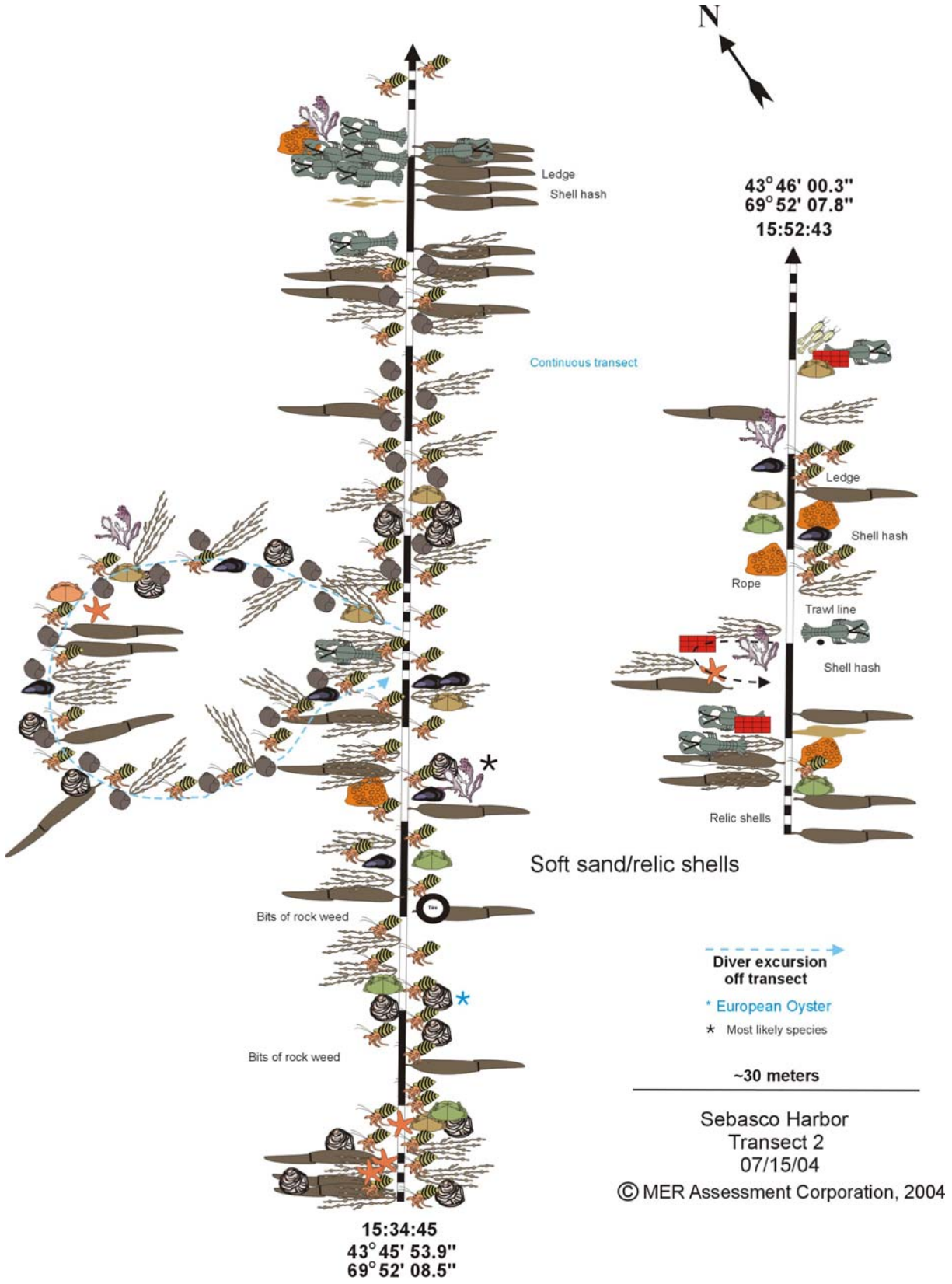


**Figure 5. Transect 3**

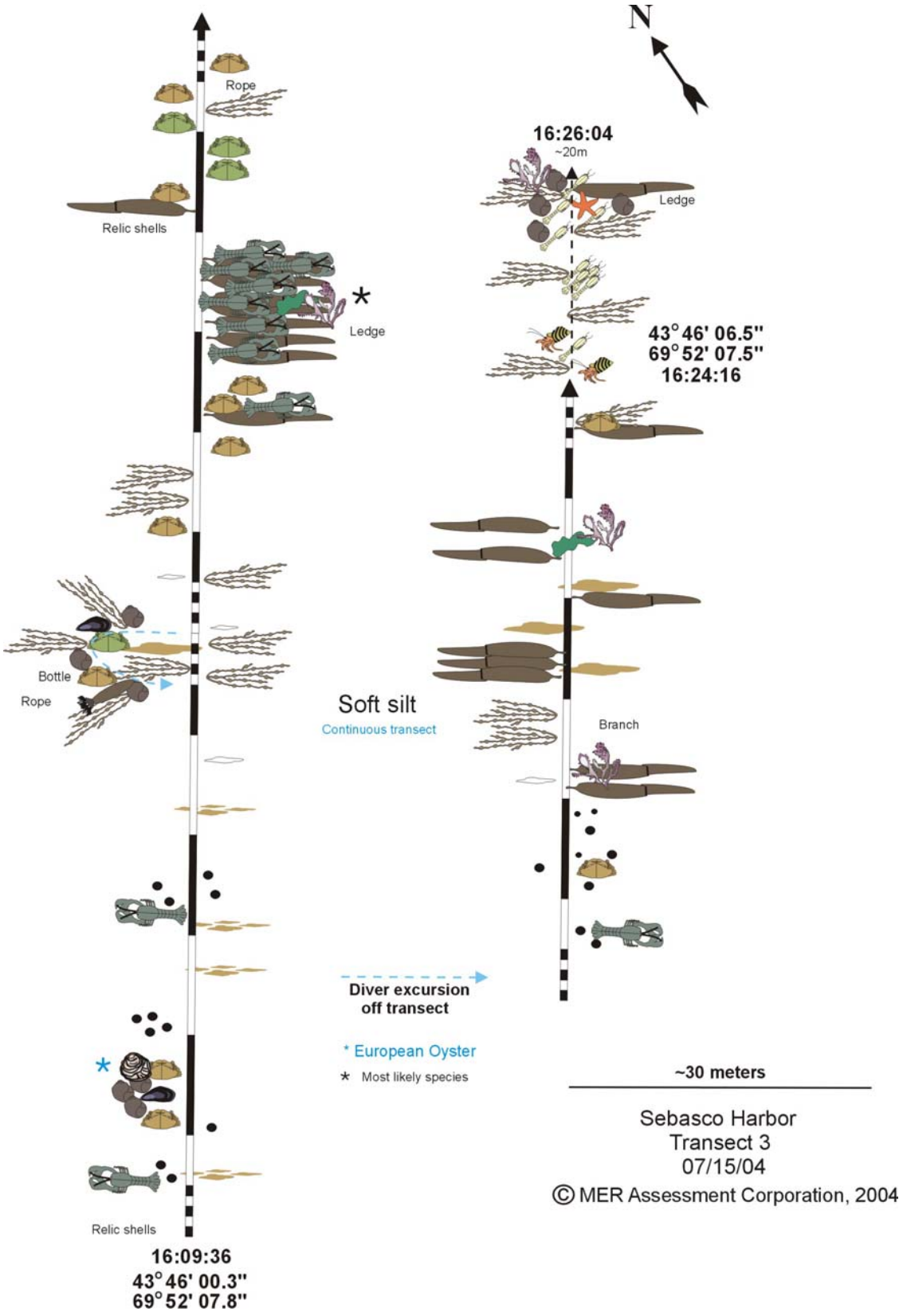
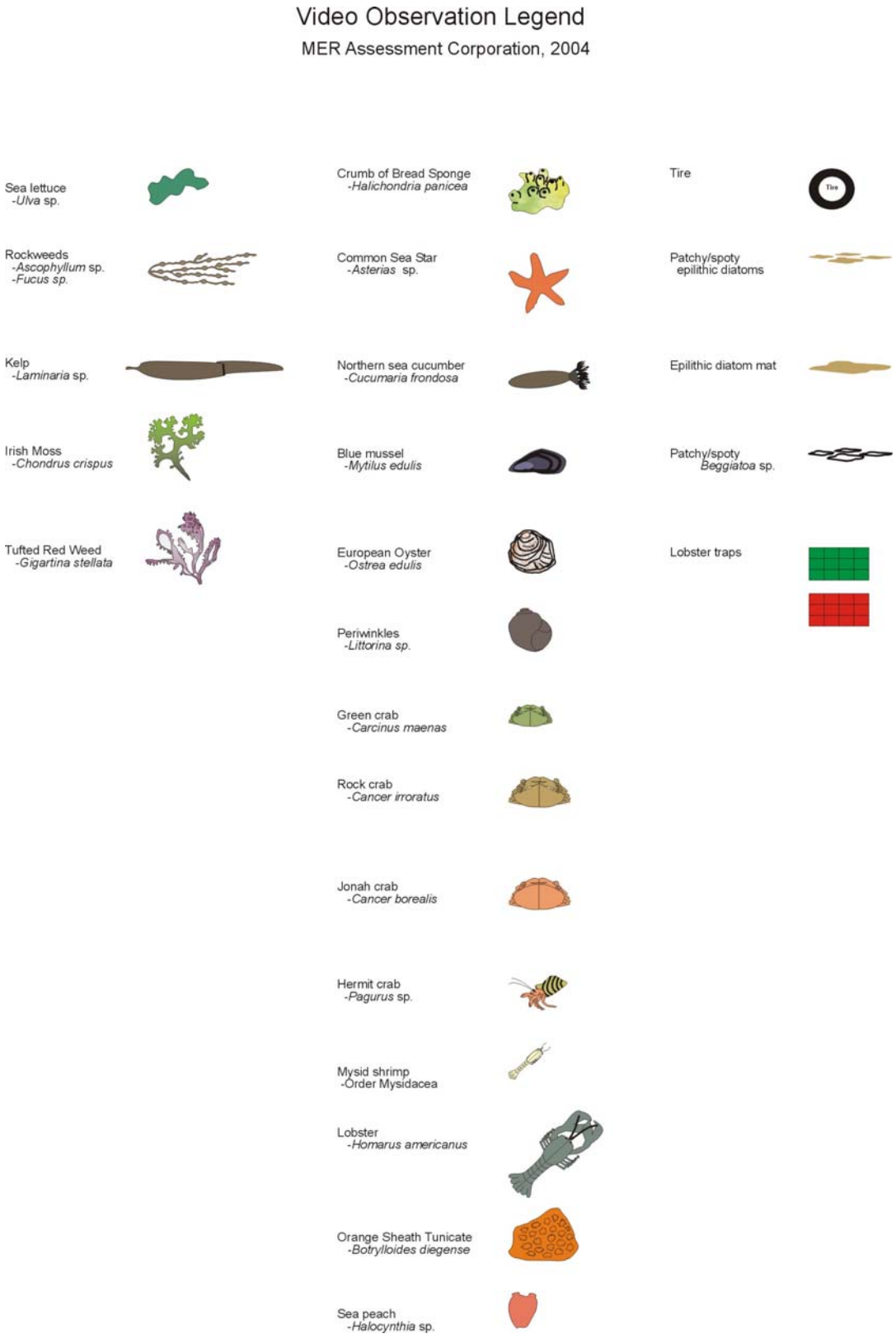


**Figure 6 Diver/video observations icons legend**



## Conclusions

Based on direct observations by the diver and the reviews of the video recordings, shellfish resources within the Sebasco Harbor area affected by the shellfish harvesting closure appear rather limited. The only species occurring at a level that might be of commercial interest is the European oyster, but even this resource is limited and the entire standing population could likely be harvested in a single day. Consequently, despite the interest in removing as many closures as possible, improving access to shellfish resources does not appear to be a supportable rationale for pursuing reclassification of the area, at least at this time. Furthermore, although shellfish harvesting is but one of many reasons for seeking to reclassify currently closed areas to open/approved status, the current economic value of the existing resources does not warrant the level of expenditure that would be required to ensure such reclassification.

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