

Appendix 4 - Description of Special, Sensitive, or Unique Species and Habitats

Chapter 2 of the Massachusetts Ocean Management Plan designates the special, sensitive, or unique species and habitats, pursuant to the Oceans Act. The following table describes these species and habitats and briefly summarizes the process of identifying their mapped extent. As described in the table, the data sources for these special, sensitive, or unique resources vary, and certain of these existing data sets are the responsibility of state agencies (e.g., the Massachusetts Division of Fisheries and Wildlife [DFW] Natural Heritage and Endangered Species Program [NHESP], Division of Marine Fisheries [*Marine Fisheries*], Massachusetts Office of Coastal Zone Management [CZM]). As part of the implementation of the plan, the Executive Office of Energy and Environmental Affairs (EEA) will work with these agencies to ensure continued data collection as appropriate, and to identify future needs regarding state agency data and research (see the science framework in Volume 2 for additional information). Certain of these datasets are from sources outside of Massachusetts state government. EEA will coordinate with the originators of such data to maximize the utility of data collection and analysis efforts for ocean management planning purposes.

Special, Sensitive, or Unique Area (SSU)	Description
North Atlantic Right Whale Core Habitat Fin Whale Core Habitat Humpback Whale Core Habitat	Areas of core whale habitat by species, represented as concentrations in abundance distributions based on datasets from the NOAA National Centers for Coastal Ocean Science report that characterizes cetacean sightings for the years 1970-2005 in the southern Gulf of Maine. The report includes records from dedicated aerial surveys and other platforms. Bias from uneven allocation of survey effort (temporally or spatially) was corrected using a sighting-per-unit-effort (SPUE) algorithm. SPUE values for each 5 x 5 minute grid cell were then interpolated spatially. The resulting interpolations were classified into quantiles and exported as filled contour polygon shapefiles. See the report ¹ for additional information. NOAA binned the data into five classes, and the top two classes were extracted to represent “core” habitat for each of these three species.

Special, Sensitive, or Unique Area (SSU)	Description
Roseate Tern Core Habitat	Areas of “core” Roseate Tern habitat, represented as breeding, staging, and critical foraging areas based on a dataset from the MA Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (DFW/NHESP) that represents documented Roseate Tern breeding, staging (presence of 100 or more individuals), and foraging areas. The breeding and staging sites were identified and mapped by DFW/NHESP biologists and buffered 0.3 nautical miles. Within the foraging areas, DFW/NHESP biologists identified core foraging areas based upon scientific literature to represent the most important foraging areas in the mapped breeding and staging areas. The breeding, staging, and critical foraging areas were extracted as Roseate Tern core habitat.
Special Concern Tern Core Habitat	Areas of “core” special concern tern habitat, represented as breeding, staging, and critical foraging areas based on a dataset from the DFW/NHESP. The core habitats delineated for three tern species (Common, Least, and Arctic, which are state-listed as species of special concern) include documented breeding, staging (presence of 100 or more pairs), and foraging areas. The breeding and staging sites have been identified and mapped by DFW/NHESP biologists. These sites were buffered 0.3 nautical miles. Within the foraging areas, DFW/NHESP biologists identified core foraging areas based upon scientific literature to represent the most important foraging areas in the mapped breeding and staging areas. The breeding, staging, and critical foraging areas were extracted as core habitat.
Leach’s Storm-Petrel Important Habitat	Areas of important Leach’s Storm-petrel habitat, represented as breeding, staging, and critical foraging areas based on dataset from the MA DFW/NHESP. Leach’s Storm-petrel is a state-listed endangered species that breeds at two locations in Massachusetts (Nomans Land Island and Penikese Island) as observed by DFW biologists. The Important Habitat areas are these breeding areas buffered 0.3 nautical miles.
Long-tailed Duck Important Habitat	Areas of important habitat for Long-tailed Ducks, represented as concentrations in abundance distributions based on a dataset that originated with Mass Audubon with additional analysis by NHESP. Mass Audubon provided radio telemetry data from Long-tailed Ducks tagged in Nantucket Sound, and from this data MA NHESP developed the spatial representation of their core habitat. The core habitat represented in the planning area includes night-time concentration areas north of Nantucket and the area of concentrated commutes to the south of Nantucket. Long-tailed Ducks have a unique winter behavior where they make a daily “commute” from Nantucket Sound, where they concentrate in particular areas at night, across Nantucket Island to Nantucket Shoals, where they disperse to feed during the day. Because this behavior and Long-tailed Duck spatial distribution on Nantucket Shoals is being studied, the plan does not indicate core habitat for long-tail ducks south of the planning area.

Special, Sensitive, or Unique Area (SSU)	Description
Colonial Waterbirds Important Nesting Habitat	<p>Areas of important nesting sites for colonial nesting waterbirds, based on dataset that originated from the MA DFW/NHESP. These sites represent areas where more than 100 pairs of the following species of colonial nesting waterbirds were observed during surveys in 1994 and 2006: Common Terns, Least Terns, Roseate Terns, Arctic Terns, Leach’s Storm-petrels, Double-crested Cormorants, Herring Gulls, Great Black-backed Gulls, Laughing Gulls, Black Skimmers, Great Egrets, Snowy Egrets, Cattle Egrets, Little Blue Herons, Black-crowned Night Herons, and Glossy Ibis. The Important Habitat areas are the nesting sites buffered 0.3 nautical miles.</p>
Areas of hard/complex seafloor	<p>Areas of hard/complex seafloor, characterized as any combination of the following: 1) areas of exposed bedrock or concentrations of boulder, cobble, or other similar hard bottom distinguished from surrounding unconsolidated sediments, 2) a morphologically rugged seafloor characterized by high variability in bathymetric aspect and gradient, or 3) man-made structures, such as artificial reefs, wrecks, or other functionally equivalent structures that provide additional suitable substrate for development of hard bottom biological communities. On a project-specific basis, proponents may be responsible for the data and analysis to delineate hard/complex bottom, pursuant to Secretary scoping requirements in the MEPA process. Guidance will be developed by the EEA Ocean Team to further define this SSU and how it should be identified by proponents on a project-specific basis. Issues to be addressed will include descriptions of scale, biogenic reefs, definitions of terms (e.g. cobble), biological communities with vertical relief, and energetic stability.</p> <p>For the ocean management plan, EEA created a map of hard/complex bottom by combining three data sources. First, a statewide bathymetry data set was created by combining the highest resolution bathymetric data sets available and then calculating rugosity, a measure of bathymetric heterogeneity. Highly rugose areas were then combined with seafloor delineated as hard bottom in USGS interpreted seafloor maps. Finally the combination of these two data sets were added to points coded as hard bottom in an augmented usSEABED sediment database. The resultant map is representative of hard/complex bottom, in that it is based upon the highest resolution data available, and a specific project may obtain higher resolution data for project planning purposes.</p>
Eelgrass	<p>Areas that support communities of rooted eelgrass (<i>Zostera marina</i>) as represented by a dataset from the Massachusetts Department of Environmental Protection (DEP) Wetlands Conservancy Program. The DEP eelgrass layer was produced from data collected, using similar methodologies, in 2001 and 1995. DEP staff interpreted 1:20,000 aerial photography at low tide during summer months (high eelgrass biomass) to delineate eelgrass polygons and then field-verified the polygons. Since this dataset incorporates other seagrass species which are found outside of the planning area, eelgrass polygons were extracted for use in the ocean management plan.</p>

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Intertidal flats	Areas of broad intertidal flats that are exposed at extremely low tides and inundated at high tides, as represented by dataset from the Massachusetts DEP that is part of a broader wetlands dataset. Wetland areas were interpreted from 1:12,000 scale, stereo color-infrared photography by staff at UMASS Amherst and then field checked by Department of Environmental Protection (DEP) Wetlands Conservancy Program (WCP). A WCP consultant scanned completed interpretations and converted them into rectified polygons and lines using standard photogrammetric techniques. WCP GIS staff performed final quality control. Intertidal flat polygons were extracted for use in the ocean management plan.
Important fish resource areas	Areas of high importance to commercial and recreational fisheries as represented by a dataset from the Massachusetts Division of Marine Fisheries (DMF) based on Resource Assessment Trawl Survey collected from 1978-2007. To create this layer, 22 species were selected for consideration. See the fisheries work group report for the description of the methodology used to identify high, medium, and low categories. For the ocean management plan, high resource areas were extracted.

¹ NOAA National Centers for Coastal Ocean Science (NCCOS) 2006. An Ecological Characterization of the Stellwagen Bank National Marine Sanctuary Region: Oceanographic, Biogeographic, and Contaminants Assessment. Prepared by NCCOS's Biogeography Team in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 45. 356 pp.