

# Chapter 2 - Plan Context

This chapter provides an overview of the existing natural resource, human use, and regulatory factors that form the basic context for the development of the Massachusetts Ocean Management Plan. It includes a description of the ocean management planning area; a brief overview of the natural resources, human uses, marine economy, and regions within the planning area; and a summary of the most pertinent regulations that currently govern management of ocean resources and uses in the Commonwealth.

## Description of the Planning Area

The Oceans Act of 2008 specifies that the ocean management plan “shall include any waters and associated submerged lands of the ocean, including the seabed and subsoil, lying between the line designated as the ‘Nearshore Boundary of the Ocean Management Planning Area’ . . . and the seaward boundary of the commonwealth.” Figure 2-1<sup>1</sup> provides a map of the planning area.

The seaward extent of the planning area is coterminous with the seaward extent of state jurisdiction, which is generally three nautical miles offshore except in certain areas (such as offshore of Boston and north of Cape Cod Bay—see Figure 2-1). The landward limit of the planning area is a line 0.3 nautical miles seaward of mean high water, although it is further from shore in certain places (such as offshore Boston Harbor—see Figure 2-1). By choosing this landward limit, the Legislature explicitly excluded most developed harbor and port areas from the planning area to ensure that the plan was a “blue water” effort focused away from direct harbor- and port-related issues.

Figure 2-2 depicts several jurisdictional boundaries adjacent to and within the ocean planning area. Five designated ocean sanctuaries are present in the ocean planning area. A majority of the ocean planning area is included in an ocean sanctuary, with the exception of the area seaward of Boston Harbor and extending south to Marshfield and then east toward Race Point—see Figure 2-2. Stellwagen Bank National Marine Sanctuary is to the east of and directly adjacent to the planning area in Massachusetts Bay. As indicated on Figure 2-2, the planning area is also bordered by Cape Cod National Seashore and the Boston Harbor Islands National Recreational Area; National Wildlife Refuges are located on Plum Island, in Mashpee, south of Chatham on outer Cape Cod, and southwest of Martha’s Vineyard (Nomans Land).

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<sup>1</sup> For production purposes, all color figures are placed at the end of the Draft Massachusetts Ocean Management Plan.

The deepest areas in the planning area are generally east of Cape Ann and in the eastern part of Massachusetts Bay (Figure 2-3). Much of southern Cape Cod Bay, Buzzards Bay, and Nantucket and Vineyard Sounds are relatively shallow.

## Natural Resources in the Planning Area

The more than 2,000 square miles of ocean waters in Massachusetts contain an abundance of important natural resources. Our understanding of the locations where different species exist or frequent during some part or all of their life (and importance of those locations) is continually evolving and has grown during the development of the ocean management plan. The following pages provide a brief overview of select species, focusing in particular on those species and their habitats with existing data that could be used in the development of the ocean plan. This section is not intended to be an exhaustive overview of all natural resources in the planning area. For additional details, see the Baseline Assessment provided in Volume 2 of the Massachusetts Ocean Management Plan.

Figure 2-4 illustrates selected bird resource areas, including habitat for the federally endangered Roseate Tern (as determined by Massachusetts Natural Heritage and Endangered Species Program biologists), areas important to other tern species of special concern, areas of important Long-tailed Duck habitat, Leach's Storm Petrel important nesting habitat areas, and important nesting habitat areas for colonial water birds. Figure 2-5 depicts fisheries resources, ranked by Division of Marine Fisheries (DMF) biologists in terms of their importance based on DMF's 30 years of fish resource trawls in state waters. Figure 2-6 illustrates shellfish and crustacean resources found in the planning area. Figures 2-7 a, b, and c illustrate sightings data for Fin, Humpback, and North Atlantic Right Whales, respectively, all of which are federally endangered species. Figures 2-7 a, b, and c also illustrate seal haul-out areas.

Seafloor mapping (bathymetry and surficial geology) is occurring in Massachusetts waters through a partnership with the U.S. Geological Survey. The results of this mapping will form a critical component for the identification and classification of benthic habitats. This mapping is still in progress, as is the development of a habitat classification system that will incorporate this data into the development of habitat maps. In the absence of completed habitat maps, other existing data can be used to provide insight into seafloor features and habitats. Figure 2-8 illustrates such data, including surficial sediments, intertidal flats and eelgrass areas, and rugosity (which is a measure of the variation in the sea bottom—areas with high rugosity have more topographical relief).

## Ecosystem Services of Massachusetts Ocean Waters

“Ecosystem services” is the collective term for the uses, goods, and benefits that humans derive from natural systems. As detailed in the Baseline Assessment in Volume Two of the Massachusetts Ocean Management Plan, the services provided by Massachusetts estuarine and marine waters have evolved over time, and many of the uses discussed below currently extend throughout the planning area. As with the natural resource section above, this section is intended to provide a general overview of human uses, focusing on those that became focal points in the development of the Massachusetts Ocean Management Plan.

### Transportation and Navigation

The ocean planning area provides access for an array of transportation and navigational uses. Massachusetts is a primary shipping destination on the Atlantic seaboard, and its ports provide the required facilities for commercial shipping and cargo handling. Products include fuel (of different types), container and bulk goods and products, fish, and other cargo. In addition to commercial shipping, the ports of Massachusetts also offer facilities for cruise ships and passenger handling, serving as important ports of call and providing facilities for the growing cruise ship industry. Ferries and commuter boats provide links to the Commonwealth’s islands and popular tourist and commuter destinations. Figure 2-9 depicts a variety of navigational uses, including shipping lanes, pilot boarding areas, U.S. Coast Guard-designated precautionary areas, and ferry routes. Also shown on Figure 2-9 are Automatic Information System (AIS) and Vessel Monitoring System (VMS) data, representing commercial ship traffic greater than 299 tons and commercial fishing vessels fishing in federal waters, respectively.

### Infrastructure

The ocean planning areas and its adjacent waters and lands support critical infrastructure facilities and appurtenant structures and connections including: several fossil fuel energy generating facilities, a nuclear facility, submarine communications and electric cables, discharges from wastewater treatment plants, industrial process water and stormwater discharges from commercial and industrial facilities, and two permitted ocean disposal areas. Existing infrastructure (cables, pipelines, dredge disposal areas, and lighthouses) is shown in Figure 2-10.

### Commercial Fishing

Commercial fishing by means of mobile and fixed gear (trawls, dredges, longlines, pots, weirs, and gill nets) is extensive in the planning area. The major fisheries in

Massachusetts include shellfish (including scallops, conch, quahogs, and surf clams), finfish, lobsters, crabs, and urchins. New Bedford, Gloucester, Provincetown, and Boston are home to the state's major commercial fleets, but nearly all harbors and inlets in Massachusetts support some type of commercial fishing activity.

Commercial fisheries activity at a broad, statewide level is shown in Figure 2-11, which indicates areas of varying importance to commercial fisheries from the standpoint of effort and value. In addition to this statewide analysis, Executive Office of Energy and Environmental Affairs (EEA) staff met with commercial fishermen to obtain an understanding on a smaller scale (related to an individual port) of the types of fisheries, gear employed, and seasonal restrictions in place. An example of the qualitative results from these meetings is included in Figure 2-12.

### Recreational Boating

Recreational boating includes a wide array of activities such as personal pleasure cruising, destination-based personal navigation, fishing, diving, and wildlife viewing. Recreational fishing occurs throughout the planning area and over a million anglers regularly use the waters of the planning area for recreational fishing, primarily by hook and line. Recreational fishing for lobster and crab using pots, and recreational shellfishing with various handgears in the nearshore areas, are also very popular. Figure 2-13 illustrates areas identified through a DMF survey as important to recreational fishing. Figure 2-14 shows areas important for recreational use, according to results from the Massachusetts Marine Trades Association, along with boat registrations on a town-by-town basis, boating access sites, marinas, and recreational dive sites.

### Renewable Energy

Massachusetts has no fossil fuel reserves but has substantial renewable energy resources. Offshore wind energy will play a significant role in meeting current and future energy needs, strengthening national energy security, and reducing greenhouse gas emissions. The Massachusetts coast and offshore areas offer considerable wind power potential, classified as excellent to outstanding by the U.S. Department of Energy National Renewable Energy Laboratory. With its proximity to major urban demand centers, Massachusetts is a prime candidate in the pursuit of sustainable development of offshore wind resources. Figure 2-15 shows the offshore wind resources in and beyond the planning area. Figure 2-15 also includes proposed tidal energy locations (from Federal Energy Regulatory Commission applications), tidal current information, and the location of the proposed Marine Renewable Energy Center (MREC) test area.

## Aquaculture

Aquaculture is another vital use in the planning area. Currently, Massachusetts's exclusive form of commercial marine aquaculture is shellfish, and several methods of cultivation are used to grow quahogs, oysters, bay scallops, soft shell clams (and to a lesser extent surf clams and blue mussels). Existing aquaculture in the ocean planning area is limited to areas in/around Wellfleet Harbor. With technological advances and improved understanding of oceanographic conditions, offshore aquaculture has considerable promise for the future.

## Sand and Gravel

Extensive sand and gravel resources exist in state waters. Projects to address severe erosion and public infrastructure and safety issues through the extraction of sand and gravel and onshore placement for beach and shoreline stabilization/nourishment have been permitted outside the planning areas, but none has yet occurred within the planning area. With the growing threats of coastal erosion and inundation through the effects of increasing sea-level rise and storm frequency and intensity, however, there will be an increase interest in sand and gravel extraction from the planning area.

## Military

A diverse suite of military activities, from bombing to dredging to ports of call, historically occurred in and over the planning area. While the use of live ordinance has decreased or completely ceased, military training exercises continue by the Air National Guard, Army Corps of Engineers, Coast Guard, and Navy.

## Other Uses

Other important uses of the Commonwealth's estuarine and marine systems include recreation and tourism, educational and scientific activities, historical and archeological sites, and services for aesthetic, cultural, and religious purposes. Figure 2-16 depicts boating access, historic, and submerged shipwreck sites in the ocean planning area.

The information provided above indicates that Massachusetts waters are heavily used. Additional work funded by the Massachusetts Ocean Partnership conducted by the National Center for Ecological Analysis and Synthesis at the University of California Santa Barbara also attempted to look at the cumulative impact of human uses. Preliminary results of this effort are shown in Figure 2-17, which verifies that Massachusetts waters are relatively heavily used and that no location is untouched by human uses.

## Marine Economy

While many uses of ocean waters are important to commerce, trade, and industry, a study prepared by the Donahue Institute of the University of Massachusetts found that five major sectors drive the Commonwealth's marine economy, with a combined total annual output of \$14.8 billion (in 2004 dollars). Information about the major marine economy sectors is provided below. (Unless otherwise specified, all figures are from the Donahue Institute.)

### Tourism and Recreation

Coastal tourism and recreation—which includes recreational fishing and recreational boating—had the highest annual output at \$8.7 billion in 2004. Marine-related recreation and tourism is also a significant employer in the state—the largest marine sector by far. Recreational boating activity is extremely important in this sector, and according to statewide information compiled by the Massachusetts Marine Trades Association, in 2007 there were nearly 200,000 registered recreational boats and Massachusetts boaters spent about \$383 million on boating-related trips. The total economic value of recreational boating—including multipliers—was \$3 billion in 2007.

### Commercial Seafood

The commercial seafood sector has deep cultural and historical roots in the Commonwealth. The 2004 value of commercial seafood sector—comprised of fishing and fishing supplies, marine aquaculture, seafood processing and wholesaling, and retail and food service seafood sales—was \$1.6 billion. As discussed below, commercial fishing is important in each of the five regions of the ocean planning area. According to the National Marine Fisheries Service, in 2007, Massachusetts ranked second only to Alaska in terms of value (by landings) in the United States. New Bedford was the top-ranked port by value with \$268 million, while Gloucester is ranked fourteenth with \$46.9 million. It is believed that these values are conservative, underestimating the value of commercial landings because of their focus on landings of species from federal waters. DMF reports that individual species with more than \$5 million in annual landed value in 2007 include sea scallop, lobster, monkfish, cod, haddock, winter flounder, Atlantic sea herring, yellowtail flounder, skates, and witch flounder. Two species—scallop and lobster—combine to approach 50% of the total landed value of all species. The Massachusetts aquaculture industry is also very important and is a growing trade. In 2006, DMF estimated the aquaculture sub-sector to be comprised of 374 aquaculture farms worth an estimated \$6.3 million in sales.

## Transportation

The 2004 annual output for the marine transportation sector was estimated at \$529 million. Among other services, the sector includes foreign and domestic freight and cargo, water passenger transportation, and towing and tugboat services. There are seven major customs ports in Massachusetts: Boston, Fall River, Gloucester, New Bedford, Plymouth, Provincetown, and Salem. In the past decade, increases in the volume traded at Massachusetts ports have been greater than the general increases seen in volumes traded at all the nation's North Atlantic ports. However, channel depth at Massachusetts ports will limit future growth because of the changing characteristics of the cargo fleet toward significantly larger, deeper-draft vessels. The ships calling now are carrying the maximum load possible given the port's channel depths. Besides commercial shipping, the ports of Massachusetts also offer facilities for cruise ships and passenger handling, serving as important ports of call and providing facilities for the growing cruise ship industry valued in the hundreds of millions.

## Science and Technology

Massachusetts is one of the top ten states in the nation in the marine science and technology industry—and the dominant state in New England—in terms of the concentration of employment and economic activity. Specifically, the marine science and technology sector has an annual output of \$1.2 billion in Massachusetts. In this sector, there are significant value-added products and high-wage subsectors, which generate substantial local buying power and thus additional demand for goods and services within the state. In Massachusetts, the marine science and technology sector has the highest average wages and a very high employment multiplier (e.g., for every job generated in this sector, an additional 1.27 jobs are generated in the state economy). In 2004, sponsored marine research at higher education research institutions in the Commonwealth was valued at more than \$170 million.

## Construction and Infrastructure

Marine-related construction and infrastructure, with annual production of \$2.8 billion in 2004, serves as a foundation for much of the marine industry. This sector provides capacity for other marine economy sectors to expand through such efforts as maintenance and improvement of ports and navigation channels, construction and operation of gas pipelines and electric and telecommunication cables, and the beneficial re-use of dredged material for beach nourishment. In the future, the marine-related construction and infrastructure sector will assume a stronger role because of investments in marine renewable energy and shore protection projects—like dredging for beach nourishment and the construction of seawalls, groins, and jetties.

## Regional Overview

Massachusetts's ocean waters present distinct regional differences. The following is a brief and very general overview of the natural resources, industrial/shipping activities, commercial uses and fisheries, recreational activities, and other major ocean uses in five regions of the ocean planning area: North Shore, Boston Harbor, South Shore, Cape and Islands, and South Coast.

### North Shore

Following the coastline from Salisbury to Revere, the ocean planning area for this region extends seaward to the three-mile limit of state territorial waters around Cape Ann; south of Cape Ann, state waters (and the planning area) extend farther seaward to a state jurisdictional line running from Cape Ann to Scituate.

- Natural Resources - North of Cape Ann is generally a sand and flat bottom coast with a significant barrier beach/saltmarsh system, which serves as a stopover on the Atlantic Flyway for migratory birds. South of Cape Ann is characterized by hard bottom and relief. The Great Marsh, which comprises over 25,000 acres of beach/marsh habitat across the Essex Bay and Plum Island Sound area, defines the coastal character of the region and provides habitat for many ocean-dwelling fish species. The Merrimack River is a major run for diadromous fish and contains populations of endangered fish species. Jeffries Ledge north of Cape Ann is a major geographic destination for fishing and boating. Whales and other marine mammals frequent North Shore waters, particularly east and south of Cape Ann. The water quality is good outside of harbors and embayments, but enclosed and/or populated areas typically experience some impairment of water quality in the immediate vicinity of sewage outfalls and, more broadly, following periods of significant rain, leading to temporary closures of shellfish beds.
- Industrial Activity and Shipping - In general, only Gloucester and Salem are hubs of industrial activity in the North Shore area of the state's oceans. Both of these ports have industrial shipping activity supported by major federal navigation channels. There is a transitway offshore and parallel to the coast for ships heading north from Boston to destinations in Maine, New Brunswick, and Nova Scotia. Sewage outfalls are located along the coast (Newburyport, Ipswich, Rockport, Gloucester, Manchester, Salem, and Lynn). Salisbury to Gloucester is characterized by a lack of industrial features other than sewage outfalls. The Merrimack River carries industrial effluent, including treated sewage and industrial process water, to the ocean waters of this region.

- Commercial Uses and Fisheries - Commercial fishing (all kinds, including charters, party boats, etc.) and boating (whale watching, kayak tours) occur extensively in the nearshore waters. The Merrimack River, Cape Ann, and Salem Sound areas are homeport to significant fleets of fishing and tourism vessels, and the Annisquam River is also heavily used for tourism and recreational fishing purposes. Gloucester serves as a homeport for many vessels that fish in federal waters; a main transit-way for such vessels extends southeast of Gloucester to Stellwagen Bank. Essex Bay and Plum Island Sound are areas of significant commercial use by ecotourism businesses. While lobster potting occurs in virtually all nearshore waters, it is generally concentrated within the 120-foot depth line. The waters between Nahant and Manchester and between Gloucester and Rockport are the two most productively fished areas in the region, making up a large percentage of the total state lobster catch. Dragging, gillnetting, and lobster potting occur from Eastern Point south through Massachusetts Bay; dragging and scallop dredging occur in Ipswich Bay.
- Recreational Activity - Recreational boating occurs throughout North Shore waters, and every harbor and port supports some level of boating activity. The Merrimack River, Plum Island Sound, Essex Bay, Cape Ann, and Salem Sound are major hubs of recreational activity; the near-shore areas between Boston, Salem, and Cape Ann are heavily used by boaters, including those transiting between locations. The Annisquam River/Blynman Canal is a major recreational feature that connects Ipswich Bay and Massachusetts Bay. Recreational boating destinations include nearshore fishing locations, all of Cape Ann for diving, Stellwagen Bank, and the Isles of Shoals, particularly for boaters out of the Merrimack River. The Great Marsh is a major recreational destination. North of Cape Ann is characterized by public beaches of regional and national significance.
- Other - The U.S. Coast Guard has stations in Newburyport and Gloucester.

During the development process for the Massachusetts Ocean Management Plan, stakeholders in the North Shore raised the following major issues:

- Economic, social, and traditional importance of commercial and recreational fishing to North Shore communities.
- Minimization of conflicts between new and traditional uses of ocean resources.
- Continued viability of tourism and other aspects of the coastal economy.
- Continued public involvement in the development and implementation of the ocean management plan.

- Opportunity for new uses of the ocean to provide jobs and address other policy issues, such as meeting renewable energy goals and providing opportunities for sediment for beach nourishment.

## Boston Harbor/Massachusetts Bay

Covering the coastal communities from Winthrop to Weymouth, state ocean waters in this region extend seaward into Massachusetts Bay to the jurisdictional line running from Cape Ann to Scituate. As stipulated in the Oceans Act of 2008, however, the coastal waters of Boston Harbor (marked by a line running from Winthrop to Hull) are not included as part the ocean planning area (see Figure 2-1).

- **Natural Resources** - Massachusetts Bay is characterized by diverse seafloor environments, including hard bottom and intertidal ledges; areas of gravel, cobble, and sand; and deeper areas where mud and clay accumulate. Despite the high human use of the region, these diverse subsurface characteristics provide important habitat for a variety of species. Most notable are juvenile lobster, which are found in sand and gravel areas. Humpback, finback, and right whales are found in Massachusetts Bay. Fringing Massachusetts Bay are productive and healthy eelgrass beds, which offer refuge and an opportunity for recruitment of lobsters and commercially and recreationally desirable fish (e.g. winter flounder and cod) to the rest of the bay. The Massachusetts Water Resources Authority (MWRA) treatment plant, which treats the sewage from metropolitan Boston communities and releases treated effluent nine miles offshore, has significantly improved nearshore water quality since it began operation in 2000. Monitoring of Massachusetts Bay water quality does not appear to show significant adverse impacts from the outfall, although the potential for chronic impacts continues to be studied. Stellwagen Bank National Marine Sanctuary, which is eastward of the state ocean waters of this region, is highly productive area of nutrient upwelling that provides abundant food for a variety of species of fish, marine mammals, and sea birds. Given the proximity to this important feeding ground, several whale species frequent Massachusetts Bay waters, including the endangered humpback and northern right whales.
- **Industrial Activity and Shipping** - Boston is a maritime industrial hub for New England, and consequently, ocean uses centered around port activity dominate the surrounding waters. The Port of Boston has direct calls by large container vessels from Europe and the Far East, and 14 million tons of bulk cargo enter its waters each year. In 2002, 250,000 cruise passengers and more than 100,000 automobiles came across its docks. Shipping traffic enters

and leaves Boston Harbor from all directions, with the shipping lanes east of Boston Harbor and south to and from the Cape Cod Canal being main traffic routes; vessels also head to the north and northeast out of Boston. The Port of Boston is estimated to have an \$8 billion impact on the economy, producing more than 9,000 direct jobs. The Conley container terminal, the complex of uses on the Mystic River, Logan Airport, and Chelsea Creek are major industrial features. The Fore River Shipyard in Quincy (whose use is discontinued) and Weymouth Back River with its gas pipeline and ships carrying petroleum products are areas of localized industrial activity. The federally designated Massachusetts Bay Disposal Site for dredged material is located just outside state waters on the edge of the Stellwagen Bank National Marine Sanctuary, and historical dumping grounds are noted on National Oceanic and Atmospheric Administration charts and include two prominent areas: the Boston Lightship site and the Industrial Waste Site (IWS). A natural gas pipeline (the Hubline) extends from Weymouth to Salem, and two offshore liquefied natural gas ports have pipelines that connect to the Hubline east of Marblehead.

- Commercial Uses and Fisheries - Boston Harbor supports a major concentration of commercial uses, with the greatest commercial activity occurring around and landward of the Boston Harbor Islands (most of which is landward of the ocean planning area). Commercial fishing vessels, dive charters, and passenger ferries frequent the nearshore waters of the region. Farther offshore, Stellwagen Bank and neighboring waters support whale watching and charter and party boat operations. Major commercial routes crisscross Massachusetts Bay connecting Boston to the Cape Cod Canal, Provincetown, and Stellwagen Bank. Massachusetts Bay is heavily used for commercial fishing, and supports a major lobster fishery, groundfish dragging, gillnetting, and charter and party boats. Generally, dragging occurs where the bottom is flat and open; other gear is used on areas of greater relief.
- Recreational Activity - Recreational boating is significant throughout Massachusetts Bay. Major destinations include Stellwagen Bank for fishing and whale watching and the Boston Harbor Islands for boating, hiking, fishing, and diving. Major recreational routes connect Boston with the Harbor Islands, Cape Cod Canal, Annisquam River, Provincetown, and Stellwagen Bank. Recreational fishing, particularly for striped bass, is an important ocean use throughout the region, and diving occurs at numerous nearshore areas.

- Other - The U.S. Coast Guard has a station in Boston. Military vessels from the U.S. Navy and other countries visit Boston occasionally; some repair/service facilities for military vessels are also available.

Major issues raised by stakeholders in the Boston Harbor/Massachusetts Bay region included:

- Minimizing conflict with existing uses of ocean waters, including commerce (shipping), recreational uses, and commercial fishing.
- Protection of important species and habitats.
- Ecosystem-based management as a foundation for the ocean management plan's approach.
- Acknowledgement of activities and uses outside of the planning area.
- Continued public involvement in the development and implementation of the ocean management plan.
- The potential for ocean sediment resources to provide material for beach nourishment.

### South Shore

Extending from Hingham to Plymouth, this region includes ocean waters along the South Shore that extend seaward to the jurisdictional line from Cape Ann to Scituate, then out to the three-mile limit in the Scituate and Marshfield area, and out into Cape Cod Bay in the southern end of the region.

- Natural Resources - The South Shore coastline is predominantly sand and cobble beaches interspersed between rocky outcroppings and coastal drumlins to the north and high coastal banks to the south. Erosion is an issue, particularly on the beaches and coastal banks. Nearshore gravel and cobble beds support juvenile lobster. Cape Cod Bay is a more protected and less dynamic, although erosion of coastal banks along the edge of the Bay can be considerable. This relatively shallow, flat embayment is characterized by sandy/silty sediments, sandier to the northwest and siltier to the southeast. A large portion of Cape Cod Bay is designated critical habitat for northern right whales, which typically inhabit the waters during winter and early spring, although individual whales may periodically stay on later in the year. Humpbacks, other species of whales, other marine mammals, and turtles also frequent these waters. The water quality is generally good, but in some areas, rain events flush septage from nearshore leach fields and other

nonpoint source pollution from developed areas into coastal waters, leading to temporary and localized closures of shellfish beds.

- Industrial Activity and Shipping - There are relatively few industrial uses on the South Shore and in Cape Cod Bay. Scituate, Marshfield, and Plymouth have nearshore sewage outfalls, and the water-cooled Pilgrim Nuclear Power Station in Plymouth is the only major industrial facility in the region. The Cape Cod Canal supports small- and medium-sized commercial ship traffic to and from Boston and points north; tugs and barges carrying petroleum products represent the majority of the industrial traffic, which runs parallel up the western coast of the bay to Boston and points north.
- Commercial Uses and Fisheries - Commercial boating, including fishing operations (finfish, lobster, and charter), whale watching, sightseeing, and commuter ferry service out of Hingham, are major uses in this region. Lobster potting in South Shore waters account for a significant portion of the state lobster catch. Groundfish dragging and localized scallop dredging occur in Cape Cod Bay and there is significant fishing for tuna, bluefish, striped bass, and shark. The harbors of Marshfield, Scituate, Duxbury, and Plymouth support major commercial fleets, and the remaining harbors and inlets of the region support some level of commercial fishing activity. Duxbury has significant intertidal aquaculture activities and many South Shore towns have shellfish seeding programs to enhance the local shellfish resource for commercial and recreational diggers.
- Recreational Activity - Fishing, diving, and sailing are major uses of South Shore and Cape Cod Bay waters. Marshfield, Scituate, Duxbury, and Plymouth harbors also support major recreational boating activities and supporting infrastructure, such as boatyards, marinas and yacht clubs. Stellwagen Bank is a major destination for recreational fishing and boating. The beach and nearshore areas along the entire periphery of the region are heavily used for swimming, boating, kayaking, strolling, and fishing. Recreational diving and potting for lobster occurs throughout the region.
- Other - The U.S. Navy periodically conducts small fleet maneuvers in the waters between the Cape Cod Canal and Massachusetts Bay off Boston Harbor.

Stakeholders in the South Shore region raised the following major issues:

- Importance of commercial/recreational fishing and recreational uses in the region.
- Reduction of potential conflict between traditional uses of ocean resources and potential new uses.
- Protection of important natural resources.
- Continued public involvement in the development and implementation of the ocean management plan.

### Cape Cod and Islands

This region covers the largest portion of the ocean planning area and includes: Cape Cod Bay from Bourne to Provincetown, the waters of the Atlantic Ocean three miles out from Provincetown to Monomoy, all of Nantucket Sound to the state jurisdictional boundary line, and the area out to the three-mile state limit around the rest of the Cape Cod, Martha's Vineyard, and Nantucket.

- Natural Resources - Cape Cod and the Islands are characterized by sandy barrier beaches backed by coastal dunes and banks along much of the coast, with dozens of coastal embayments and estuarine harbors scattered along the coastline. The surrounding waters vary from the very shallow depths of Nantucket Sound and the Nantucket Shoals, to the deeper waters of Cape Cod Bay and Vineyard Sound, to the ocean depths immediately off the eastern shore of Cape Cod. In this area to the east, the bathymetry quickly reaches depths of 100 feet and more, with the area subject to significant unimpeded wave energy; the shallower and more protected waters along much of the rest of the coastline are much more quiescent by comparison. There are thousands of acres of salt marsh, and the area is significant to several endangered species of birds (including Roseate Terns) and vegetation. The numerous estuaries, embayments, and tidal rivers found in this region provide excellent habitat for a variety of fish and shellfish species, and help support a strong local shellfish industry. The Cape Cod National Seashore includes portions of six of the outer cape towns, and the Cape is also home to the Mashpee and Monomoy National Wildlife Refuges (NWR); Nomans Land southeast of Martha's Vineyard is also a NWR. Billingsgate Shoal, off Wellfleet in Cape Cod Bay, is a major submarine feature and forage ground for gamefish. As mentioned above, Cape Cod Bay is critical habitat for the endangered northern right whale. Other species of whales, marine mammals, and turtles also inhabit the Bay. The water quality is generally good and locally excellent (e.g., Wellfleet Harbor is designated as a body of

- **Industrial Activity and Shipping** - The industrial uses of the area are primarily related to fuel transport and storage. There are tank facilities located in Vineyard Haven Harbor on Martha's Vineyard and on Nantucket. Fuel is transported by barge to both of these facilities in significant quantities. Small coastal cruise ships call at Martha's Vineyard, Nantucket, and occasionally Provincetown. There are also industrial transport activities associated with the year-round ferry service to the islands from Hyannis and Woods Hole. Woods Hole also supports a fleet of deep sea research vessels and fisheries vessels operated by the National Oceanic and Atmospheric Administration and National Marine Fisheries Service. The Cape Cod Disposal Site, a state-designated site for dredged material, is located in state waters off Wellfleet. Designated in 1994, the site has been used by municipal and private facilities located in surrounding communities. The site is closed from January to mid-May to avoid impacts with northern right whales.
- **Commercial Uses and Fisheries** - Commercial fishing takes place with various fleet sizes in many of the harbors across the Cape and the Islands. While many smaller day trip boats dock at harbors such as Hyannis, Oak Bluffs, and Menemsha, the most significant efforts take place from Aunt Lydia's Cove and Stage Harbor in Chatham, and from MacMillan Pier in Provincetown. Fisheries include lobster potting; fish, scallop and quahog dragging; and commercial-scale tuna and other finfish efforts. Hyannis, Falmouth, Menemsha, Oak Bluffs, and Nantucket host large charter fishing fleets, and Rock Harbor in Orleans is home to one of the biggest charter fishing fleets in the northeast. Additionally, whale watching and eco-tourism operations embark from several harbors in the region. Shellfish aquaculture is a major nearshore (intertidal) commercial use, particularly along the eastern shoreline of Cape Cod Bay in the Wellfleet area.
- **Recreational Activity** - The entire region is largely dependent on tourism and therefore on the accommodation of recreational activities and the environmental conditions necessary for the support of that economy. The Cape hosts the largest whale watching fleet on the east coast, with the majority of the vessels operating from Provincetown throughout Cape Cod Bay and Stellwagen Bank. Recreational boating popularity has increased substantially throughout the region during the past decade and there are more than 50 boat yards and other boat service facilities located on the Cape and Islands. The Cape and Islands are a very popular destination for cruising

boats, and vessels from all over the world visit the region during the summer months. The region is known for abundant winds, and all forms of sailing activities take advantage of this. Numerous sailing regattas are held annually, attracting sailing vessels from all over New England. Wind surfing and wind kiting have become very popular, and kayaking has become very popular in recent years due to the many estuaries, embayments, and tidal rivers that provide excellent areas for these small craft. Stellwagen Bank and Billingsgate Shoal off Wellfleet are major destinations for recreational fishing boats from the upper Cape, and recreational lobster diving and potting is also significant throughout the region.

- Other - The 23,000-acre Massachusetts Military Reservation (MMR) is located within the towns of Sandwich, Mashpee, Falmouth, and Bourne. MMR is home to units of the Massachusetts Army National Guard, Air Force Reserve, and Coast Guard. In addition to its air field and aircraft support facilities, field training and anti-terrorism training are conducted on the base. As a result of the various military activities over the years, there are several ground contamination sites located on and around MMR and remediation efforts are underway on many of these sites. Nomans Island, off the southwest shore of Martha's Vineyard, was used by the military as a bombing-practice site for decades and is not currently open for public access due to the presence of unexploded ordinance. However, it has been subject to some clean-up efforts and is currently under the management of the U.S. Fish and Wildlife Service as a wildlife refuge. The U.S. Coast Guard has stations in Provincetown, Chatham, Sandwich, Woods Hole, Nantucket, and Menemsha. The region is also home to the Wampanoag Tribes of Mashpee and Aquinnah (Gay Head).

Major issues raised in the Cape Cod and Islands region included:

- Protection of tourism and recreational uses, commercial fishing, and other existing aspects of the economy that rely on ocean resources.
- Protection of important habitat areas.
- Coordination across jurisdictional levels (federal, state, local).
- Continued opportunities for public involvement in implementation of the ocean management plan.
- Need for sound science in the ocean management plan.
- Ensuring that renewable energy is sited responsibly.
- Ability to adapt plan in the future as new science and information is developed.

## South Coast

Covering the coastal communities westward of Cape Cod, this region's ocean planning area includes all of Buzzards Bay.

- **Natural Resources** - Buzzards Bay is a relatively shallow estuary with depths to about 20 meters. Unlike Massachusetts's ocean areas north of Cape Cod, it receives relatively warm waters from the south through the Gulf Stream. This highly productive system includes thousands of acres of salt marsh, tidal flats, and eelgrass beds. The bay has ubiquitous and highly valuable fishing resources (including scup, tautog, blue fish, and striped bass) and is home to some of the richest shellfish resources in the Commonwealth. Buzzards Bay provides vital habitat for endangered and rare species, including piping plovers, leatherback turtles, diamondback terrapins, and more than half of the North American population of the endangered roseate tern. Finally, while the central portion of Buzzards Bay has excellent water quality, many of the smaller sub-embayments along its shoreline exhibit various degrees of nonpoint source pollutants, primarily excess nitrogen and microbial pathogens.
- **Industrial Activity and Shipping** - The industrial ports of New Bedford and Fall River (which is outside of the ocean planning area) are significant economic engines for the region. Focusing on New Bedford, the port is predominated by approximately 400 large fishing vessels, but also receives cargo ships and, increasingly, cruise vessels. New Bedford is also home to a large and vibrant fish processing center that not only processes catch landed locally, but also large quantities of fish from around the globe brought in by freighter and airplane. In addition, there are significant large boat repair operations within the harbor. Ferry operations serving Martha's Vineyard operate year round (and are currently considering providing service to Woods Hole on Cape Cod). Buzzards Bay is the center of extensive shipping activity, serving as the southern funnel to the Cape Cod Canal, through which pass vast quantities of petroleum and cargo bound for Boston and other ports farther north. It is estimated that approximately 2 billion gallons of petroleum products pass through Buzzards Bay each year.
- **Commercial Uses and Fisheries** - Since 2000, New Bedford has been ranked the highest dollar-value fishing port in the nation, with the annual fish landings valued at more than \$268 million in 2007. Small commercial fishing occurs seasonally in Buzzards Bay for lobster, scup, tautog, and other species, which are fished mostly by small boats either working out of local harbors or

brought in by trailer and launched for the day. Party boat activities for sport fish (such as blues, scup, and striped bass) are conducted out of New Bedford Harbor and smaller commercial sport fishing boats are available in many of the harbors throughout the bay. There are also extensive commercial shellfish activities throughout the area.

- Recreational Activity - Buzzards Bay provides significant recreational boating opportunities and is world-renowned for its ideal sailing conditions. In the early 1990s, it was estimated that there were approximately 13,000 recreational boats moored or docked in Buzzards Bay, a relatively high percentage of which were sailboats. Shellfishing and fin fishing are favorite recreational activities for residents and visitors throughout the favorable seasons. The beaches of the region are heavily used throughout the summer. These include many town beaches and Horseneck Beach State Reservation, Demarest Lloyd State Park, Nasketucket Bay Reservation, and Fort Phoenix State Reservation.

In the South Coast region, the following major issues were raised:

- Importance of protecting recreational uses, commercial fishing, and other existing aspects of the economy that rely on ocean resources.
- Minimizing conflicts between new and existing uses of ocean resources.
- The need to ensure continued opportunities for public involvement in implementation of the ocean management plan.
- Protection of important habitats.
- Need for incorporating best available science into ocean management plan.

## Regulatory Context

Several laws and associated regulatory provisions exist in Massachusetts and provide policy direction for, and regulation and management of, ocean resources and uses. The key state and federal statutes are summarized below; the list is not meant to be exhaustive but to provide a summary of some of those statutes directly relevant for the purposes of the ocean management plan. Several of the most pertinent federal statutes and regulatory programs are also summarized. The Cape Cod Commission and the Martha's Vineyard Commission operate at the regional level and have regulatory authority, which is also summarized briefly, along with other regional efforts. Certain state regulations are administered locally, as described below.

## State Statutes, Regulations, and Policies

The following state regulatory mechanisms are most significant in the ocean planning context.

- Ocean Sanctuaries Act - Much of the planning area is included within one of the five designated Ocean Sanctuaries pursuant to the Ocean Sanctuaries Act (OSA) (M.G.L. ch 132A, §12A-16F and 302 CMR 5.00). Prior to the Oceans Act of 2008, the Department of Conservation and Recreation (DCR) administered the OSA; the Oceans Act shifted that responsibility to the Office of Coastal Zone Management (CZM). The OSA sets a baseline for management of uses in Ocean Sanctuaries, as modified by the Oceans Act.
- Oceans Act of 2008 - The Oceans Act (Chapter 114 of the Acts of 2008) requires the Secretary of Energy and Environmental Affairs to develop a comprehensive, science-based ocean management plan. The Oceans Act includes several provisions related to the regulation of ocean uses and natural resources. It amends section 15 of the Ocean Sanctuaries Act to allow for the siting of “appropriate scale” offshore renewable energy facilities in state waters, except for the Cape Cod Ocean Sanctuary (generally offshore from the Cape Cod National Seashore on the Outer Cape), provided that the facility is consistent with the ocean plan. The Oceans Act also requires that all state agency regulatory decisions must be consistent, to the maximum extent practicable, with the ocean management plan. As discussed above under the Ocean Sanctuaries Act, the Oceans Act requires an advisory committee to review the definitions of and standards for the OSA terms “significantly alter” and “public necessity and convenience.” Finally, the Act establishes an Ocean Resources and Waterways Trust Fund (“the Fund”) funded by mitigation fees, grants, Legislative appropriations, and income from the investment credited to the Fund.
- Massachusetts Environmental Policy Act - MEPA (M.G.L. ch 30, §61-62H and 301 CMR 11.00) requires that state agencies study the environmental consequences of their actions, including permitting and financial assistance. It also requires them to take all feasible measures to avoid, minimize, and mitigate damage to the environment. MEPA further requires that state agencies “use all practicable means and measures to minimize damage to the environment,” by studying alternatives to the proposed project, and developing enforceable mitigation commitments, which will become permit conditions for the project if and when it is permitted. MEPA applies to projects above a certain size threshold that involve state agency action.

- Massachusetts Public Waterfront Act (Chapter 91) - Commonly known as Chapter 91 and administered by the Department of Environmental Protection (MassDEP), this law (M.G.L. ch 91 and 310 CMR 9.00) protects the public's interest in waterways of the Commonwealth. It ensures that public rights to fish, fowl, and navigate are not unreasonably restricted and that unsafe or hazardous structures are repaired or removed. Chapter 91 also protects the waterfront property owner's ability to approach his/her land from the water. Chapter 91 regulates activities and structures on both coastal and inland waterways, including construction and dredging and filling in tidelands, great ponds, and navigable rivers and streams.
- Clean Water Act Section 401 Water Quality Certification - The federal Clean Water Act Section 401 (33 USC 1341 et seq., §401; M.G.L. c 21 §26-53 and 314 CMR 4.00 and 9.00) process is administered by MassDEP. The review ensures that projects proposing discharge of fill or dredged materials into jurisdictional wetlands comply with Massachusetts Surface Water Quality Standards and the Massachusetts Wetlands Protection Act, and otherwise avoid, minimize, or mitigate impacts to areas of Massachusetts subject to Section 401. Section 401 applies to any project that is subject to federal regulation under the Clean Water Act. If the project results in minimal fill within wetlands, the local Order of Conditions (see Wetlands Protection Act below in Locally Administered Regulations) can also serve as the Section 401 Water Quality Certificate; otherwise, an individual permit review process by MassDEP is required. Consultation between MassDEP and DMF usually occurs during the Section 401 review process to ensure that impacts to finfish and shellfish and their habitat are minimized.
- Massachusetts Endangered Species Act - The state's Endangered Species Act (M.G.L. Chapter 131A and 321 CMR 10.00) provides for listing of endangered or threatened species or species of concern, and of their habitat. Once listed, the Act prohibits the taking, possession, transport, export, processing, sale or purchase of such species and any other species listed under the federal Endangered Species Act. The Act prohibits any alteration of significant habitat of any protected species that may reduce the viability of the habitat. The Act is administered by the Natural Heritage and Endangered Species Program (NHESP) within the Massachusetts Department of Fish and Game (DFG). The Massachusetts program also coordinates with the federal Endangered Species Act, administered by the U.S. Fish and Wildlife Service.

- Massachusetts Division of Marine Fisheries Aquaculture Regulations - Under M.G.L. c130 §57 and 322 CMR 13.00, the Division of Marine Fisheries (DMF) reviews proposed aquaculture licenses to determine if the license and resulting aquaculture activities will substantially harm shellfish or other natural resources. The scope of the review depends on the type and size of aquaculture.
- Coastal Zone Management Act Federal Consistency Review - Under 16 USC 1451 et seq and 15 CFR 930; M.G.L. c 21A §2, 4 and 301 CMR 20.00, states have the authority to review federal actions (projects or approvals) to ensure that such actions meet standards articulated in the state's coastal zone management plan through a process called federal consistency review. Federal consistency review is required for most projects that are in, or can reasonably be expected to affect a use or resources of, the Massachusetts coastal zone; and/or require certain federal licenses or permits, receive certain federal funds, or are a direct action of a federal agency. In Massachusetts, federal consistency review is administered by CZM.
- Fisheries Management - DMF manages commercial and recreational fisheries in Massachusetts and may adopt, amend, or repeal all rules and regulations necessary for the maintenance, preservation, and protection of all marine fisheries resources within its jurisdiction. The Oceans Act states that this authority is to be maintained.

## Federal Statutes, Regulations, and Policies

Many federal laws, such as the Submerged Lands Act, Magnuson-Stevens Fishery Conservation and Management Act, and National Marine Sanctuaries Act, affect the management of ocean uses and resources. The laws listed below, however, are the most particularly pertinent for the Massachusetts planning context.

- National Environmental Policy Act (NEPA) - NEPA (42 USC §§ 4321 to 4370e and 43 FR 55990) establishes environmental protection as a national policy goal and directs all federal agencies to consider the environmental consequences of their projects and permitting actions. NEPA set up a system for formal evaluation of environmental impacts of the actions of federal agencies, the centerpiece of which is the Environmental Impact Statement (EIS). This document includes an analysis of alternatives to the proposed action, a discussion of impacts from the proposed action, and disclosure of any irretrievable commitment of resources. Typically, a federal agency with an action on a project will prepare an Environmental Assessment. Following

publication in the Federal Register and a comment period, the agency will either issue a Finding of No Significant Impact or will decide to prepare an EIS to more fully examine alternatives, impacts, and mitigation. One federal agency is usually designated as the “lead” agency, and this agency will prepare the EIS. Other federal and state agencies may play an official role in preparation by becoming “cooperating” agencies. At the completion of the EIS process, the lead agency issues a Record of Decision making environmental findings.

- Marine Mammal Protection and Federal Endangered Species Acts - The primary federal legislation that provides for the protection and management of marine mammals is the Marine Mammal Protection Act of 1972 (MMPA; Pub. L. 92-522; 16 U.S.C. §§ 1361 et seq.). Under the Act, the National Oceanic and Atmospheric Administration (NOAA) has responsibility for ensuring the protection of cetaceans (whales, porpoises, and dolphins) and pinnipeds (seals and sea lions), except walruses. The federal Endangered Species Act (ESA; Pub. Law 93-205; 16 U.S.C. § 1531 et seq. 50 CFR 17.00) also provides protection to the five species of great whales and five species of marine turtles in Massachusetts. Under the ESA, the National Marine Fisheries Service (NMFS) has designated critical habitat for the Right Whale in the New England area in Cape Cod Bay and the Great South Channel. The NMFS Office of Protected Species has also created a multi-organizational Northeast Large Whale Recovery Plan Implementation Team. This team examines the causes of human induced mortality to large whales and proposes ways to reduce or eliminate them.
- Rivers and Harbors Act and Clean Water Act Section 404 - The Rivers and Harbors Act of 1899 (33 USC §§ 401-413 and 33 CFR 323) regulates navigation in waters of the United States, although in recent years the application of the Act has broadened to include environmental considerations. Section 10 of the Act regulates placement of structures in navigable waters. Section 404 of the Clean Water Act (33 USC § 1251 and 33 CFR 322) regulates discharges of dredged or fill material into waters of the United States. The U.S. Army Corps of Engineers implements both statutes. For small projects subject to these laws, the Army Corps has issued a Massachusetts Programmatic General Permit, establishing general performance standards for all work. For larger projects, individual permits are required.
- Outer Continental Shelf Lands Act - The Outer Continental Shelf Lands Act (Pub. L. 83-212; 43 U.S.C. §§ 1331 *et seq.*), as amended by the 2005

Energy Policy Act and previous amendments, gives the U.S. Department of the Interior (through the Minerals Management Service) the authority to lease offshore tracts through competitive bidding; collect royalties on production of oil and natural gas; and consider economic, social, and environmental values of renewable and nonrenewable resources in managing the outer Continental Shelf (OCS). In 2005, Congress further amended the Act to grant primary authority to the Minerals Management Service to authorize alternative energy projects on the OCS.

## Regional Planning Agencies

Apart from the Cape Cod and Martha's Vineyard Commissions (discussed separately below), there are three regional planning organizations with geographic jurisdiction that overlaps the coastal zone. These are the Merrimack Valley Planning Commission (MVPC), the Metropolitan Area Planning Council (MAPC), and the Southeastern Regional Planning and Economic Development District (SERPEDD). For these three agencies, the geographic focus of their efforts is typically land based or very near shore, and the only programmatic connection to offshore issues occurs in the form of participation in one of the National Estuary Programs (discussed separately below).

However, both the Cape Cod Commission and Martha's Vineyard Commission have state authority to regulate development within their area of jurisdiction, which potentially includes projects within the ocean planning area. Each commission has been given the authority to designate Districts of Critical Planning Concern (DCPCs) through their regional plan, impose a moratorium on specified development within a proposed district until the designation process is complete, and approve a body of special locally enforced rules to govern the type and manner of development after the moratorium expires. Both commissions are empowered to review (and potentially condition ) projects determined to be Developments of Regional Impact (DRIs), and no local permit may be issued without commission concurrence based, at least in part, on an analysis of a project's consistency with the pertinent regional plan.

## National Estuary Programs

CZM administers two National Estuary Programs (NEPs), both funded by EEA and the U.S. Environmental Protection Agency (EPA). These are the Massachusetts Bays Program and the Buzzards Bay National Estuarine Program (formerly the Buzzards Bay Project). The cornerstone of each of the NEPs is the development and implementation of a Comprehensive Conservation and Management Plan (CCMP) to identify actions that should be taken to maintain and improve the ecological integrity of the environmental resources within the bays and their surrounding

watersheds. Both programs are limited in their relationship to the ocean management plan because the predominant focus of the action plans is on activities that either occur outside the ocean planning area or do not lend themselves to marine spatial analysis.

### Locally Administered Regulations

The following state regulations that are implemented at the local level are significant to ocean management in Massachusetts.

- Massachusetts Wetland Protection Act - The Wetland Protection Act (M.G.L. ch 131 §40 and 310 CMR 10.00) is administered by local Conservation Commissions and MassDEP and is intended to protect wetland resources. The regulations require avoidance, minimization, and mitigation of impacts (including impacts to aquatic vegetation, flood control, and fisheries and wildlife habitat), and establish performance standards that define levels of impact that a project cannot exceed. For projects that meet the performance standards, local Conservation Commissions may issue an Order of Conditions specifying under what conditions a project may proceed. The applicant or any 10 citizens residing in the municipality may appeal the local Order to MassDEP, which then issues a Superseding Order confirming, modifying, or overturning the local decision (a further appeal to an adjudicatory process is possible). For projects that do not meet the performance standards, a proponent must obtain a variance from the regulations from MassDEP, upon a demonstration that the project meets the tests for a variance. The variance tests include provisions that the project serves an “overriding public interest,” that there are no feasible alternatives to the project, and that the project design incorporates substantial mitigation for impacts to wetland resources.
- Chapter 91 10A Harbormaster’s Permit for Bottom-Anchored Structures - This subset of the Chapter 91 licensing process is administered by local harbormasters. Section 10A annual permits are required for temporary moorings, floats, rafts held by bottom anchor, and associated ramps. This provision only applies to bottom-anchored moorings, floats, or rafts. No piles may be placed without proper Chapter 91 authorization from the MassDEP’s Waterways Regulation Program.